CORRELATION OF THE INFORMATION LITERACY STANDARDS AND INDIANA'S ACADEMIC STANDARDS FOR BUSINESS SERVICES AND TECHNOLOGY EDUCATION

Prepared by the
Indiana Department of Education
School Library Media Specialists' Leadership Cadre
Information Literacy Task Force Committee

March 2003

ACKNOWLEDGEMENTS

The preparation of this Inspire enhanced document would not have been possible were it not for the individual and collective efforts of several key people:

Phyllis Land Usher, Assistant Superintendent, Indiana Department of Education Center for School Improvement and Performance for her vision; Dorothy Winchester, IDOE Director of Program Development and Lynn Soskel Davis, Training Coordinator, Division of Human Resources for their collaborative efforts; Nancy McGriff, Vickie Thomas, Mary Watkins, and Marge Cox, Indiana Association of Media Educators members for their direction, leadership, and professional expertise. INCOLSA's support of these "INSPIRED Correlations" was critical to their completion.

Classroom teachers and library media specialists shared their expertise for this document. Their work to impact instruction through the Indiana Academic Standards, Correlations and INSPIRE will be appreciated by thousands of students and teachers. The following people gave of their time and talents to complete these "INSPIRED Correlations".

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Laura J. Taylor, Director,
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Judy R. Williams
Library Media Consultant

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The leadership role and encouragement of Phyllis Land Usher, Assistant Superintendent, Center for School Improvement and Performance provided the vision, impetus, and funding for the project from the first contact by the Association of Indiana Media Educators (AIME) leadership until completion of the first phase of this project.

Nancy McGriff, working as a member of the SLMS Cadre and the initial AIME Committee, carried the responsibility for developing the framework and assembling the personnel to develop the document. During the 2001-2002 academic year, Vickie Thomas and Mary Watkins, members of the SLMS Cadre and state AIME chairpersons, assumed the leadership role with the correlations for music, physical education, social studies, and visual arts. Marge Cox, AIME Past President, continued the process for the 2002-2003 academic year. The key members of the SLMS Information Literacy Standards Task Force involved in the entire process of actual reading, writing, and editing of the correlation document are:

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Special recognition for their generous contribution in time and encouragement are extended to Dorothy Winchester, IDOE Director of Program Development; and Barbara K. Beadle, Program Specialist.

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INDIANA INFORMATION LITERACY STANDARDS FOR STUDENT LEARNING

The Indiana Department of Education, Office of Learning Resources, supports the need for the Indiana Academic Standards 2000 to address student library information literacy standards. Charged with this task, the School Library Media Specialists' (SLMS) Cadre Information Literacy Task Force Committee, a collaborative committee of members of the Indiana Department of Education's Technology Leadership School Library Media Specialists and the Association of Indiana Media Educators (AIME), developed a correlation document. It correlates to the Nine Information Literacy Standards developed by the American Association of School Librarians (AASL) and the Association for Educational Communications and Technology (AECT) into Indiana's Academic Standards for Business Technology Education.

A copy of this document, Correlation of the Information Literacy Standards and Indiana's Academic Standards for Business Services and Technology Education is available at www.doe.state.in.us/olr.

Purpose of the Correlation of Library Information Literacy Standards and Indiana's Academic Standards for Business Technology Education

The mission of the school library program as stated in Information Power: Building Partnerships for Learning (1998) is to "ensure that students and staff are effective users of ideas and information."

The Correlation of the Information Literacy Standards and Indiana's Academic Standards for Business Services and Technology Education identifies the School Library Information Literacy Standards in the newly adopted Indiana's Academic Standards for Business Technology Education. SLMS will use these standards to work cooperatively with the building principals, classroom teachers and other professional staff members to insure that student library information literacy standards are taught through a collaborative effort in all curricular areas.

Indiana Legal Requirements for School Library Media Program

The Indiana Administrative Code, 511 IAC 6.1-5.6 Media Program delineates the minimum requirements for a school library media program:

> Sec. 6. All schools shall have a media program that is an integral part of the educational program. A licensed media specialist shall supervise the media program. Each school shall spend at least eight dollars ($8) per student per year from its 222000 account to maintain its media program. (*Indiana State Board of Education; 511 IAC 6.1-5.6; filed Jan 9, 1989, 11:00 a.m.: 12 IR 1192)*

RELATIONSHIP BETWEEN READING IMPROVEMENT AND SCHOOL LIBRARY MEDIA PROGRAM

The direct relationship between reading improvement and an active school library media program staffed by a licensed professional librarian is substantiated by research studies released within the past two years in Colorado, Pennsylvania, and Alaska. [These published studies include: How School Librarians Help Kids Achieve Standards; the Second Colorado Study (April 2000); Information Empowered; The School Librarian as an Agent of Academic Achievement in Alaska Schools (1999); Measuring Up to the Standards; The Impact of School Library Programs and Information Literacy in Pennsylvania Schools (February 2000).]

A Study of the Differences Between Higher-and Lower-performing Indiana Schools, a study by NCREL commissioned by Superintendent of Public Instruction, Dr. Suellen Reed, was published in February 2000. The study reports one necessary component to increase student performance in lower-performing schools is to "increase student access to instructional and print materials in lower-performing schools, including regular and flexible access to a working library."

In this context, a working school library with flexible access is open during the regular school hours, is staffed by a professional, licensed school library media specialist, and provides for open and easy access by individual students. Using best practices supports the use of collaboratively planned units involving the classroom teacher and the school library media specialist (SLMS). Dr. David V. Loertscher in Reinventing Indiana's School Library In the Age of Technology; A Handbook for Principals and Superintendents states that the library collection shall contain the "right materials for the right learners at the right time in every format available" to support curriculum and recreational reading needs. Through the use of Library Information Literacy Standards, teachers and SLMS work cooperatively to plan, teach, and assess the progress of students' learning.

THE NINE INFORMATION LITERACY STANDARDS FOR STUDENT LEARNING

Information Literacy

The student who is information literate

ILS 1: **accesses information** efficiently and effectively.
ILS 2: **evaluates information** critically and competently.
ILS 3: **uses information** accurately and creatively.

Independent Learning

The student who is an independent learner is information literate and

ILS 4: **pursues information** related to personal interests.
ILS 5: **appreciates** literature and other creative expressions of **information**.
ILS 6: strives for excellence in information seeking and knowledge generation **(generates knowledge).**

Social Responsibility

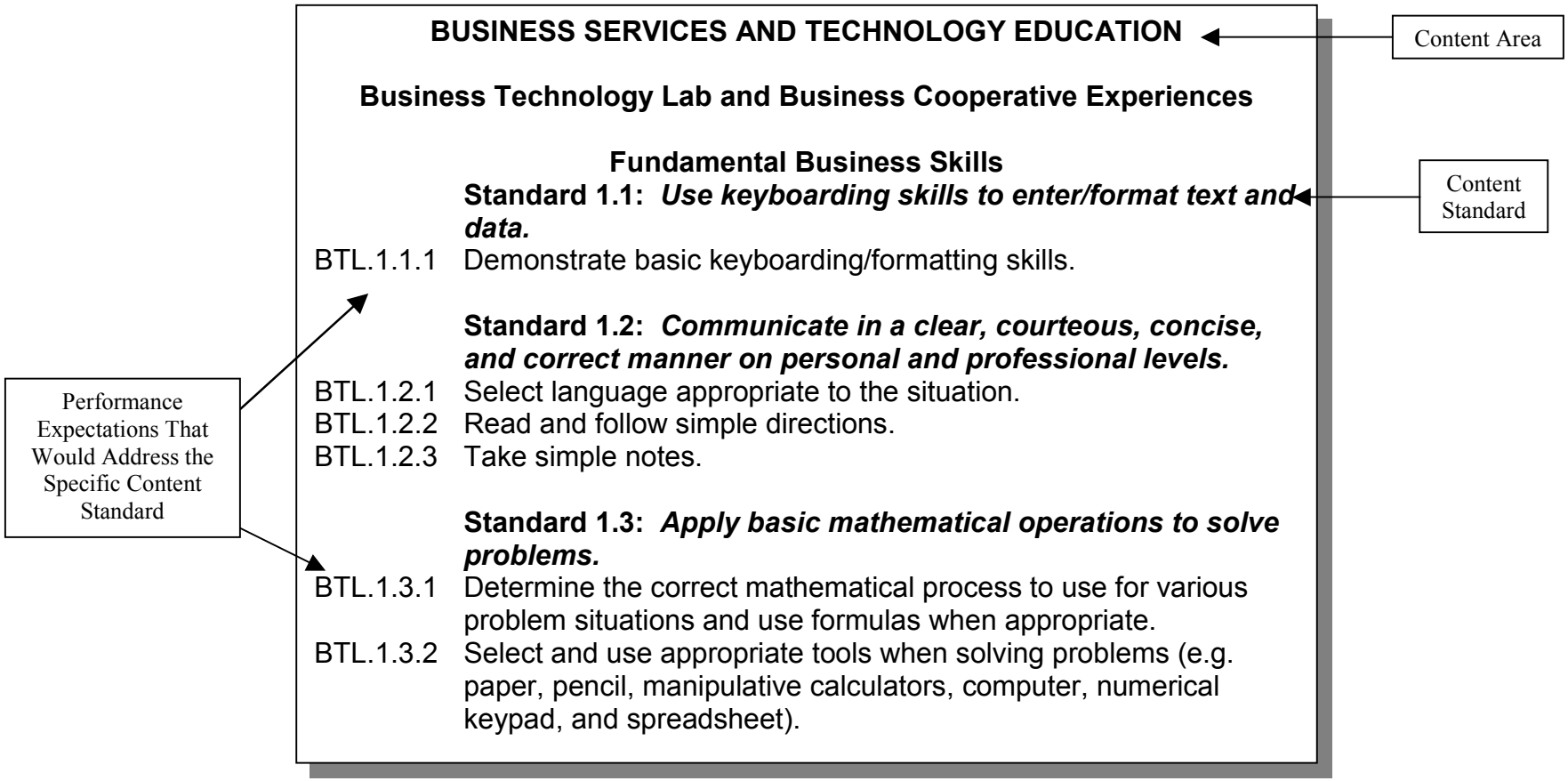
The student who contributes positively to the learning community and to society is information literate and

ILS 7: **recognizes the importance of information in a democratic society**.
ILS 8: **practices ethical behavior** in regard to information and information technology.
ILS 9: participates effectively in groups to pursue and generate information **(shares and collaborates)**.

* **Bold face** on this page indicates shortened phrasing used in listing of Information Literacy standards in the Correlation of the Library Information Literacy Standards and Indiana's Academic Standards for Business Technology Education.

READING THE STANDARDS AT EACH GRADE LEVEL

Each of the Business Services and Technology Education Standards includes the following components to aid teachers in understanding and incorporating them into their instruction.



CORRELATION OF THE INFORMATION LITERACY STANDARDS AND INDIANA'S ACADEMIC STANDARDS FOR BUSINESS SERVICES AND TECHNOLOGY EDUCATION
Release date 2003

INDICATOR NUMBER		ILS 1 ACCESSES INFORMATION	ILS 2 EVALUATES INFORMATION	ILS 3 USES INFORMATION	ILS 4 PURSUES INFORMATION	ILS 5 APPRECIATES INFORMATION	ILS 6 GENERATES KNOWLEDGE	ILS 7 RECOGNIZES IMPORTANCE OF INFO TO DEMOCRATIC SOCIETY	ILS 8 PRACTICES ETHICAL BEHAVIOR	ILS 9 SHARES AND COLLABORATES
	Business Technology Lab and Business Cooperative Experiences									
	Fundamental Business Skills **INSPIRE>EBSCO Host>Business Source**									
	Standard 1.1: ***Use keyboarding skills to enter/format text and data.***									
BTL.1.1.1	Demonstrate basic keyboarding/formatting skills.	x	x	x						
	Standard 1.2: ***Communicate in a clear, courteous, concise, and correct manner on personal and professional levels.***									
BTL.1.2.1	Select language appropriate to the situation.	x	x	x	x	x	x	x	x	x
BTL.1.2.2	Read and follow simple directions.	x	x	x						
BTL.1.2.3	Take simple notes.	x	x	x						
BTL.1.2.4	Write logical, coherent phrases, sentences, and paragraphs, incorporating correct spelling, grammar, and punctuation.	x	x	x	x	x	x	x	x	x
BTL.1.2.5	Follow oral directions.	x	x	x						
BTL.1.2.6	Use courtesy and tact when dealing with others.	x	x	x	x	x	x	x	x	x
	Standard 1.3: ***Apply basic mathematical operations to solve problems.***									
BTL.1.3.1	Determine the correct mathematical process to use for various problem situations and use formulas when appropriate.	x	x	x			x		x	
BTL.1.3.2	Select and use appropriate tools when solving problems (e.g. paper, pencil, manipulative calculators, computer, numerical keypad, and spreadsheet).	x	x	x		x	x	x	x	x
	Standard 1.4: ***Select and use word processing, database, and spreadsheet software.***									
BTL.1.4.1	Use word processing software to create, modify, store, retrieve, and print documents.	x	x	x	x	x	x	x	x	x
BTL.1.4.2	Use database software to plan, create, update, add, and delete records and prepare simple reports.	x	x	x	x	x	x	x	x	x
BTL.1.4.3	Use spreadsheet software to design, create, manipulate, store, retrieve, update, add, search, sort, print, chart, and delete data.	x	x	x	x	x	x	x	x	x
	Entry-Level Business Functions									
	INSPIRE>Indiana Links>Business>Indiana Business Magazine									
	Standard 2.1: ***Use technology to enhance the effectiveness of communications.***									
BTL.2.1.1	Use manuals, documentation, terminology, and other reference materials.	x	x	x				x		
BTL.2.1.2	Use the telephone, facsimile, electronic mail, voice mail, teleconferencing, and video conferencing to transmit and receive communications.	x	x	x	x	x	x	x	x	x
BTL.2.1.3	Use presentation and multimedia software in the development of communication materials.	x	x	x	x	x	x	x	x	x

	Standard 2.2: *Apply appropriate communication skills in personal and professional situations.*									
BTL.2.2.1	Demonstrate courtesy and good manners when interacting with others.	x	x	x			x	x		x
BTL.2.2.2	Exhibit appropriate meeting/greeting/introduction skills.	x	x	x			x	x		x
BTL.2.2.3	Compose various business documents, such as letters, memos, and reports, demonstrating correct style, content, and format.	x	x	x	x	x	x	x	x	x
BTL.2.2.4	Proofread/edit business documents to meet established guidelines.	x	x	x	x	x	x	x	x	x
BTL.2.2.5	Demonstrate proper oral communication techniques when making presentations.	x	x	x	x	x	x	x	x	x
BTL.2.2.6	Apply effective listening skills.	x	x	x	x	x	x	x	x	x
BTL.2.2.7	Handle telephone calls in a businesslike manner.	x	x	x	x	x	x	x	x	x
BTL.2.2.8	Demonstrate effective negotiation skills.	x	x	x	x	x	x	x	x	x
	Standard 2.3: *Implement and maintain manual and automated records management systems.*									
BTL.2.3.1	Understand primary records management systems.	x	x	x					x	
BTL.2.3.2	Apply appropriate records management system for specified situation.	x	x	x	x	x	x	x	x	x
BTL.2.3.3	Code, file, retrieve, transfer, and maintain information for specified records management system.	x	x	x	x	x	x	x	x	x
	Standard 2.4: *Exhibit the necessary skills to maintain office equipment and supplies.*									
BTL.2.4.1	Inventory equipment/supplies and identify needs.	x	x	x	x	x	x	x	x	x
BTL.2.4.2	Order, verify, and store/distribute supplies.	x	x	x	x	x	x	x	x	x
BTL.2.4.3	Utilize manuals and other reference materials.	x	x	x	x	x	x	x	x	x
BTL.2.4.4	Demonstrate safe and effective equipment use.	x	x	x	x	x	x	x	x	x
BTL.2.4.5	Determine/report equipment and software problems.	x	x	x	x	x	x	x	x	x
	Standard 2.5: *Understand and apply the fundamentals of ergonomics and business/personal safety.*									
BTL.2.5.1	Use ergonomic principles to maximize performance.	x	x	x	x				x	
BTL.2.5.2	Demonstrate proper safety procedures.	x	x	x	x				x	x
	Technology Skills									
	INSPIRE>Indiana Links>Business>Indiana Business Research Center									
	Standard 3.1: *Select and use various business software applications, including personal information management and industry-specific software.*									
BTL.3.1.1	Use word processing, desktop publishing, database, and spreadsheet software to prepare usable business documents and to solve organizational problems.	x	x	x	x	x	x	x	x	x
BTL.3.1.2	Integrate various software applications to prepare a usable business document/presentation.	x	x	x	x	x	x	x	x	x
BTL.3.1.3	Use presentation management, multimedia, and imaging software/hardware to prepare a variety of business presentations.	x	x	x	x	x	x	x	x	x
BTL.3.1.4	Use voice recognition software to input/manipulate data.	x	x	x	x	x	x	x	x	x
BTL.3.1.5	Use reference materials such as on-line help, tutorials, Internet, and manuals to solve problems.	x	x	x	x	x	x	x	x	x
BTL.3.1.6	Use personal information management software to effectively organize daily routines.	x	x	x	x	x	x	x	x	x
BTL.3.1.7	Identify and apply various industry-specific software applications (inventory, payroll, accounting, etc.) to business situations.	x	x	x	x	x	x	x	x	x
	Standard 3.2: *Install, upgrade, and maintain hardware/software systems.*									
BTL.3.2.1	Assemble, remove, install, and upgrade various hardware components.	x	x	x	x	x	x	x	x	x
BTL.3.2.2	Diagnose/repair problems resulting from hardware installation and use.	x	x	x	x	x	x	x	x	x
BTL.3.2.3	Use reference materials such as on-line help, tutorials, Internet, and manuals.	x	x	x	x	x	x	x	x	x
BTL.3.2.4	Install/setup various software applications.	x	x	x	x	x	x	x	x	x
BTL.3.2.5	Diagnose/repair problems resulting from software installation and use.	x	x	x	x	x	x	x	x	x

	Standard 3.3: *Create, categorize, and maintain data files in a logical manner for efficient access/retrieval.*									
BTL.3.3.	Use relevant/logical file and directory names.	X	X	X	X	X	X	X	X	X
BTL.3.3.	Organize files into appropriate folders/directories.	X	X	X	X	X	X	X	X	X
BTL.3.3.	Review and remove files on a periodic basis.	X	X	X	X	X	X	X	X	X
	Standard 3.4: *Instruct others on the use of equipment and software.*	X	X	X	X	X	X	X	X	X
BTL.3.4.1	Assist others with daily problems or in learning new features/commands.	X	X	X	X	X	X	X	X	X
BTL.3.4.2	Develop evaluation tool to measure the successfulness/effectiveness of the training.	X	X	X	X	X	X	X	X	X
	Financial Functions	X	X	X	X	X	X	X	X	X
	INSPIRE>Links>Business>Corporate Informtion									
	Standard 4.1: *Apply the financial concepts required in the daily operations of a business.*	X	X	X	X	X	X	X	X	X
BTL.4.1.1	Use manual and automated systems to complete financial functions.	X	X	X	X	X	X	X	X	X
BTL.4.1.2	Perform basic accounting functions including maintaining journals/ledgers and preparing/analyzing financial reports.	X	X	X	X	X	X	X	X	X
BTL.4.1.3	Process payroll and maintain appropriate records for both the employer and employee.	X	X	X	X	X	X	X	X	X
BTL.4.1.4	Maintain and process inventory records.	X	X	X	X	X	X	X	X	X
BTL.4.1.5	Demonstrate ability to utilize/maintain checking/savings accounts, petty cash funds, and budgets.	X	X	X	X	X	X	X	X	X
BTL.4.1.6	Prepare graphs and other statistical data to report financial information.	X	X	X	X	X	X	X	X	X
	NOTE: For students with career goals in accounting, refer to the Content Standards and for Accounting and Computerized Accounting Services.									
	Problem Solving/Decision Making/Reasoning									
	INSPIRE>EBSCO Host>Academic Search									
	Standard 5.1: *Use critical thinking, decision-making, and problem-solving techniques to promote sound, effective business decisions* .									
BTL.5.1.1	Identify and apply problem analysis techniques in the workplace.	X	X	X	X	X	X	X	X	X
BTL.5.1.2	Apply decision-making techniques in the workplace.	X	X	X	X	X	X	X	X	X
	Client/Customer Relations									
	INSPIRE>EBSCO Host>MasterFILE									
	Standard 6.1: *Understand the need for and apply positive, professional client/customer relations.*									
BTL.6.1.1	Demonstrate a client-/customer-service mindset.	X	X	X	X	X	X	X	X	X
BTL.6.1.2	Handle client/customer inquiries.	X	X	X	X	X	X	X	X	X
BTL.6.1.3	Handle difficult clients/customers.	X	X	X	X	X	X	X	X	X
BTL.6.1.4	Interpret business policies to clients/customers.	X	X	X	X	X	X	X	X	X
BTL.6.1.5	Handle client/customer complaints.	X	X	X	X	X	X	X	X	X
BTL.6.1.6	Handle situations when client/customer is at fault.	X	X	X	X	X	X	X	X	X
	Managing Information									
	INSPIRE>Links>Business>CEO Express									
	Standard 7.1: *Identify, organize, maintain, and analyze information to make sound business decisions.*									
BTL.7.1.1	Identify/utilize on-line search engines, databases, and other Internet research tools to gather information.	X	X	X	X	X	X	X	X	X
BTL.7.1.2	Collect and analyze data from primary resources (such as personal interviews) and secondary resources (such as library and Internet).	X	X	X	X	X	X	X	X	X
BTL.7.1.3	Analyze/interpret statistical data/charts to make appropriate business decisions.	X	X	X	X	X	X	X	X	X
BTL.7.1.4	Organize, process, and maintain information (written or computerized) in a systematic fashion such as note taking, transcription, and minutes and agendas.	X	X	X	X	X	X	X	X	X

	Organizing/Planning Including Personnel Functions									
	INSPIRE>Links>Busniess>Business.com									
	Standard 8.1: *Develop/use general managerial and organizational skills.*									
BTL.8.1.1	Identify and exhibit leadership qualities.	x	x	x	x	x	x	x	x	x
BTL.8.1.2	Establish realistic goals with appropriate time frames for completion.	x	x	x	x		x		x	
BTL.8.1.3	Use time-management techniques when organizing, prioritizing, and completing assigned tasks.	x	x	x	x		x		x	
BTL.8.1.4	Delegate projects to and monitor performance of other employees.	x	x	x	x	x	x	x	x	x
BTL.8.1.5	Create/maintain calendar/schedule using manual and automated methods.	x	x	x	x	x	x	x	x	x
BTL.8.1.6	Coordinate materials and arrangements for meetings and travel.	x	x	x	x	x	x	x	x	x
	Standard 8.2: *Perform the activities of human resources managers.*									
BTL.8.2.1	Participate in the hiring of new employees.	x	x	x	x	x	x	x	x	x
BTL.8.2.2	Plan and conduct new employee orientation.	x	x	x	x	x	x	x	x	x
BTL.8.2.3	Participate in employee performance evaluations and in decisions such as promotions, pay increases, and terminations.	x	x	x	x	x	x	x	x	x
	Managing Change									
	INSPIRE>EBSCO Host>Regional Business News									
	Standard 9.1: *Understand the need/value of lifelong learning as it relates to career and personal success.*									
BTL.9.1.1	Identify skills and knowledge required to improve performance and/or upgrade position.	x	x	x	x		x		x	
BTL.9.1.2	Participate in and understand the importance of involvement in professional/civic organizations and community service.	x	x	x	x	x	x	x	x	x
BTL.9.1.3	Discuss how health, motivation, and physical fitness affect performance.	x	x	x	x		x		x	
BTL.9.1.4	Determine appropriate reactions to stressful situations.	x	x	x	x		x		x	x
BTL.9.1.5	Develop strategies to accommodate impending changes in the workplace.	x	x	x			x		x	
BTL.9.1.6	Identify/exhibit strategies for coping with loss of employment.	x	x	x	x	x	x	x	x	x
	Managing a Career									
	INSPIRE>Links>Jobs & Careers									
	Standard 10.1: *Develop/reinforce strategies to make an effective transition from school to career.*									
BTL.10.1.1	Practice punctuality, dependability, and ability to work with others.	x	x	x	x	x	x	x	x	x
BTL.10.1.2	Practice appropriate interpersonal skills for working with and for others.	x	x	x	x	x	x	x	x	x
BTL.10.1.3	Formulate strategies for working effectively with co-workers of varying ages, abilities, cultural, and economic backgrounds.	x	x	x	x	x	x	x	x	x
BTL.10.1.4	Work effectively as a member of a team.	x	x	x	x	x	x	x	x	x
BTL.10.1.5	Express thoughts and ideas clearly using various forms of communication (e.g. verbal, written, body language, etc.).	x	x	x	x	x	x	x	x	x
BTL.10.1.6	Develop/demonstrate skills to give/receive constructive criticism.	x	x	x	x	x	x	x	x	x
BTL.10.1.7	Develop a personal/professional network to assist in the job search.	x	x	x	x	x	x	x	x	x
BTL.10.1.8	Develop/demonstrate appropriate attire for the workplace.	x	x	x	x		x			x
BTL.10.1.9	Write a formal application letter, resume, and follow-up letter for job opportunities.	x	x	x	x	x	x	x	x	x
BTL.10.1.10	Participate in and analyze mock interviews.	x	x	x	x	x	x	x	x	x
BTL.10.1.11	Complete job application forms.	x	x	x	x	x	x	x	x	x
BTL.10.1.12	Use correct strategies for accepting or rejecting an offer.	x	x	x	x	x	x	x	x	x
BTL.10.1.13	Demonstrate effective salary negotiation strategies.	x	x	x	x	x	x	x	x	x
BTL.10.1.14	Discuss/demonstrate appropriate oral and written steps in leaving a job (i.e. resignation, downsizing, exit interviews)	x	x	x	x	x	x	x	x	x
BTL.10.1.15	Develop a career portfolio.	x	x	x	x	x	x	x	x	x
BTL.10.1.16	Model a personal code of ethical behavior.	x	x	x	x	x	x	x	x	x
BTL.10.1.17	Model a business code of ethical behavior.	x	x	x	x	x	x	x	x	x
BTL.10.1.18	Identify ethical considerations resulting from technical advances (computer snooping, hacking, etc.)	x	x	x	x	x	x	x	x	x

BTL.10.1.19	Maintain confidentiality in business and personal dealings.	x	x	x	x	x	x	x	x	x
BTL.10.1.20	Describe the changing workplace as a result of labor legislation (drug testing, ADA, sexual harassment, safety, etc.).	x	x	x	x	x	x	x	x	x
BTL.10.1.21	Apply good time management both professionally and personally and understand the consequences of poor time management skills.	x	x	x	x	x	x	x	x	x
BTL.10.1.22	Select appropriate communication techniques to avoid, minimize, or prevent conflict.	x	x	x	x	x	x	x	x	x
BTL.10.1.23	Practice tact and courtesy in relationships with peers.	x	x	x	x	x	x	x	x	x
BTL.10.1.24	Discuss the pros and cons of office politics, romantic relationships in the workplace, and the aspects of using the	x	x	x	x	x	x	x	x	x
	"office grapevine."									

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	Business Management and Finance									
	INSPIRE>Links>Business>Fortune 500									
	Content Standards and Performance Expectations for this course should be selected from the following courses									
	- Accounting I and II									
	- Business Management									
	- Entrepreneurship, Business, College Level									
	Content Standards and Performance Expectations may also be selected from the following courses:									
	- Business and Personal Law									
	- International Business									
	- Marketing Foundations									

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	Career Planning and Success Skills									
	INSPIRE>Links>Jobs & Careers									
	Study Skills									
	Standard 1.1: *Develop individual strategies for personal and career success.*									
CP.1.1.1	Demonstrate effective study skills.	x	x	x	x	x	x	x	x	
CP.1.1.2	Utilize appropriate time management and organizational techniques.	x	x	x	x	x	x	x	x	x
	Self Assessment									
	Standard 2.1: *Assess personal characteristics as they relate to career exploration, development, and success.*									
CP.2.1.1	Complete a series of self-assessment instruments.	x	x	x	x		x		x	
CP.2.1.2	Develop short- and long-term education, lifestyle, and career goals.	x	x	x	x		x	x		
	Career and College Research									
	Standard 3.1: *Apply knowledge gained from self assessment to make future personal and career decisions.*									
CP.3.1.1	Analyze self assessment and relate results to future careers.	x	x	x	x	x	x	x	x	
CP.3.1.2	Prepare a four-year career plan.	x	x	x	x	x	x	x	x	
	Content Standard 3.2: *Utilize career and college resources to explore career choices.*									
CP.3.2.1	Explore Indiana's 14 career clusters.	x	x	x	x	x	x	x	x	
CP.3.2.2	Research several occupational interests and post-secondary educational choices.	x	x	x	x	x	x	x	x	
	Standard 3.3: *Explore trends in business.*									
CP.3.3.1	Select and use resources available for projecting career opportunities and trends.	x	x	x	x	x	x	x	x	
	Employment Seeking Skills									
	Standard 4.1: *Develop skills and tools necessary to gain employment.*									
CP.4.1.1	Prepare resume, cover letter, and thank you letter.	x	x	x	x	x	x	x	x	x
CP.4.1.2	Develop an employment portfolio.	x	x	x	x	x	x	x	x	x
CP.4.1.3	Demonstrate proper business and dining etiquette.	x	x	x	x	x	x	x	x	x
CP.4.1.4	Develop a personal/professional network to assist in the employment search.	x	x	x	x	x	x	x	x	x
CP.4.1.5	Complete employment application forms.	x	x	x	x	x	x	x	x	x
CP.4.1.6	Understand the need for pre-employment tests.	x	x	x	x				x	
CP.4.1.7	Demonstrate appropriate interviewing techniques (dress, questions, etc.).	x	x	x	x	x	x	x	x	x

	Workplace Expectations									
	Standard 5.1: *Relate workplace expectations to career development.*									
CP.5.1.1	Participate in a teacher-approved community service project.	x	x	x	x	x	x	x	x	x
CP.5.1.2	Understand strategies for working efficiently with co-workers of varying ages, gender, abilities, cultures, and economic backgrounds.	x	x	x	x	x	x	x	x	x
CP.5.1.3	Understand the importance of working as a team player in the workforce.	x	x	x	x	x	x	x	x	x
CP.5.1.4	Use appropriate interpersonal skills when dealing with others.	x	x	x	x	x	x	x	x	x
CP.5.1.5	Express thoughts and ideas clearly using various forms of communication.	x	x	x	x	x	x	x	x	x
CP.5.1.6	Understand employer expectations (punctuality, dependability, willingness to learn, cooperation, etc.).	x	x	x	x	x	x	x	x	x
CP.5.1.7	Identify employee expectations (health and safety, evaluations, fairness, pay, benefits, rights, labor/management relations, etc.).	x	x	x	x	x	x	x	x	x
	Standard 5.2: *Understand the importance of lifelong learning as it relates to personal and career growth.*									
CP.5.2.1	Relate the necessity of lifelong learning to one's ability to achieve goals.	x	x	x	x	x	x	x	x	x
CP.5.2.2	Analyze the effects of voluntary/involuntary termination.	x	x	x	x	x	x	x	x	x
	Standard 5.3: *Use appropriate techniques to promote sound personal and career decisions.*									
CP.5.3.1	Apply critical thinking and decision-making/problem solving techniques in the workplace.	x	x	x	x	x	x	x	x	x
	Standard 5.4: *Understand the procedures for beginning new employment.*									
CP.5.4.1	Complete local, state, and federal tax forms.	x	x	x	x	x	x	x	x	
CP.5.4.2	Identify basic payroll procedures.	x	x	x	x	x	x	x	x	x
CP.5.4.3	Explain the purpose of the orientation process and the probationary period.	x	x	x	x	x	x	x	x	x

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	Computerized Accounting Services									
	INSPIRE>Links>Business>American City Business Journals									
	Fundamental Business Skills									
	Standard 1.1: ***Use keyboarding skills to enter/format text and data.***									
CAS.1.1.1	Demonstrate basic keyboarding/formatting skills.	x	x	x						
	Standard 1.2: ***Communicate in a clear, courteous, concise, and correct manner on personal and professional levels.***									
CAS.1.2.1	Select language appropriate to the situation.	x	x	x	x	x	x	x	x	x
CAS.1.2.2	Read and follow simple directions.	x	x	x						
CAS.1.2.3	Take simple notes.	x	x	x						
CAS.1.2.4	Write logical, coherent phrases, sentences, and paragraphs, incorporating correct spelling, grammar, and punctuation.	x	x	x						
CAS.1.2.5	Follow oral directions.	x	x	x						
CAS.1.2.6	Use courtesy and tact when dealing with others.	x	x	x	x	x	x	x	x	x
	Standard 1.3: ***Apply basic mathematical operations to solve problems.***									
CAS.1.3.1	Determine the correct mathematical process to use for various problem situations, and use formulas when appropriate.	x	x	x			x		x	
CAS.1.3.2	Select and use appropriate tools when solving problems (e.g., paper, pencil, manipulative calculators, computer, numerical keypad, and spreadsheet).	x	x	x	x	x	x	x	x	x
	Standard 1.4: ***Select and use an appropriate operating system and word processing database, and spreadsheet software.***									
CAS.1.4.1	Use operating systems to identify parts of the desktop and explain their purposes; resize windows; manage files; run program applications; demonstrate knowledge of menus and toolbars; switch between applications; demonstrate use of control panel and printer folder; exit windows properly.	x	x	x	x	x	x	x	x	x
CAS.1.4.2	Use word processing software to create, modify, store, retrieve, and print documents.	x	x	x	x	x	x	x	x	x
CAS.1.4.3	Use database software to plan, create, update, add, and delete records and prepare simple reports.	x	x	x	x	x	x	x	x	x
CAS.1.4.4	Use spreadsheet software to design, create, manipulate, store, retrieve, update, add, search, sort, print, chart, and delete data.	x	x	x	x	x	x	x	x	x
	Accounting Cycle									
	INSPIRE>EBSCO HOST>Business Source									
	Standard 2.1: ***Demonstrate knowledge of the accounting cycle for a sole proprietorship, partnership, and/or***									
CAS.2.1.1	Create and/or maintain records.	x	x	x	x	x	x	x	x	x
CAS.2.1.2	Analyze business transactions.	x	x	x	x	x	x	x	x	x
CAS.2.1.3	Analyze end of fiscal period activities.	x	x	x	x	x	x	x	x	x

	Standard 2.2: *Demonstrate knowledge of purchases and payables as they relate to the accounting cycle.*									
CAS.2.2.1	Analyze and process purchase orders, invoices, returns and allowances, accounts payables, notes and interest payables, and payments.	x	x	x	x	x	x	x	x	
	Standard 2.3: *Demonstrate knowledge of sales and receivables as they relate to the accounting cycle.*									
CAS.2.3.1	Analyze and process invoices, accounts receivables, sales returns and allowances, uncollectible accounts, collections, notes/interest receivables, and receipts.	x	x	x	x	x	x	x	x	
	Special Applications									
	INSPIRE>Links>Busniess>Industry Links									
	Standard 3.1: *Perform various checking account functions.*									
CAS.3.1.1	Apply knowledge related to bank reconciliations.	x	x	x		x			x	
	Standard 3.2: *Apply generally accepted accounting principles (GAAP) related to cost accounting.*									
CAS.3.2.1	Process cost accounting information.	x	x	x		x	x		x	
	Standard 3.3: *Apply generally accepted accounting principles (GAAP) related to merchandise inventory.*									
CAS.3.3.1	Maintain and process inventory records using various costing methods.	x	x	x		x	x		x	
	Standard 3.4: *Apply generally accepted accounting principles (GAAP) related to managerial accounting.*									
CAS.3.4.1	Utilize appropriate managerial accounting skills to make sound financial decisions.	x	x	x		x	x		x	
	Standard 3.5: *Apply generally accepted accounting principles (GAAP) related to manual and automated payroll.*									
CAS.3.5.1	Process employee payroll records and employer payroll taxes.	x	x	x		x	x		x	
	Standard 3.6: *Apply appropriate accounting procedures to establish and maintain a petty cash fund.*									
CAS.3.6.1	Establish, journalize, and post petty cash fund entries.	x	x	x		x	x		x	
	Career Preparation									
	INSPIRE>Indiana Links>Jobs									
	Standard 4.1: *Utilize various information to explore career possibilities related to accounting skills.*									
CAS.4.1.1	Demonstrate knowledge in performing career searches and the development of communication skills.	x	x	x	x	x	x	x	x	x
	Standard 4.2: *Participate in a shadowing, internship, or a cooperative work experience program.*									
CAS.4.2.1	Recognize and display appropriate work standards for successful employment.	x	x	x	x	x	x	x	x	x
	Standard 4.3: *Participate as a member of Business Professionals of America.*									
CAS.4.3.1	Develop professional growth and self-esteem.	x	x	x	x					
CAS.4.3.2	Perform as a team member.	x	x	x	x					
CAS.4.3.3	Develop leadership skills.	x	x	x	x					
CAS.4.3.4	Polish social skills.	x	x	x	x					
CAS.4.3.5	Demonstrate parliamentary procedures.	x	x	x	x					

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	Computer Operations and Programming									
	INSPIRE>EBSCO Host>MasterFILE									
	Computer Hardware/Architecture									
	Standard 1.1: ***Describe current and emerging computer architecture; configure, install, and upgrade hardware systems; and diagnose and repair hardware problems.***									
COP.1.1.1	Identify hardware components appropriate for specific tasks	x	x	x	x				x	
COP.1.1.2	Explain the purpose, operation, and care of hardware components.	x	x	x	x				x	
COP.1.1.3	Identify examples of emerging hardware technology.	x	x	x	x				x	
COP.1.1.4	Diagnose hardware problems.	x	x	x	x				x	
COP.1.1.5	Illustrate various configurations of hardware components.	x	x	x	x				x	
COP.1.1.6	Discuss ergonomics/workstation principles.	x	x	x	x				x	
COP.1.1.7	Remove, upgrade, store, and install computer hardware.	x	x	x	x				x	
COP.1.1.8	Repair computer hardware problems.	x	x	x	x				x	
COP.1.1.9	Work toward advanced industry specific certification.	x	x	x	x				x	
	Keyboarding									
	INSPIRE>Indiana Links>Business>Indiana Business Magazine									
	Standard 2.1: Use touch keyboarding skills to enter and manipulate text and data.	x	x	x						
	Computer Applications Software									
	Standard 3.1: ***Identify, select, evaluate, use, install, upgrade, and customize application software; diagnose and solve problems occurring from an application software's installation and use.***									
COP.3.1.1	Select application types of software for a specific purpose.	x	x	x	x	x	x	x	x	x
COP.3.1.2	Describe emerging application software.	x	x	x	x	x	x	x	x	x
COP.3.1.3	Use reference materials, such as on-line help, vendor bulletin boards, tutorials, and manuals available for application software.	x	x	x	x	x	x	x	x	x
COP.3.1.4	Install, upgrade, and customize application software.	x	x	x	x	x	x	x	x	x
COP.3.1.5	Use software applications as tools to solve organizational problems.	x	x	x	x	x	x	x	x	x
COP.3.1.6	Identify, select, and apply the features of software products, such as galleries, templates, and macros.	x	x	x	x	x	x	x	x	x
COP.3.1.7	Evaluate application software products in terms of their features.	x	x	x	x	x	x	x	x	x
COP.3.1.8	Work toward advanced industry specific certification.	x	x	x	x	x	x	x	x	x

	Operating Environments and Utilities									
	INSPIRE>Links>Business>Market Research									
	Standard 4.1: ***Identify, select, evaluate, use, install, upgrade, customize, diagnose, and solve problems with various types of operating environments and utilities.***									
COP.4.1.1	Describe various types of operating environments and utilities/add-ins.	x	x	x	x	x	x	x	x	x
COP.4.1.2	Use operating environment functions.	x	x	x	x	x	x	x	x	x
COP.4.1.3	Select operating environments and utilities appropriate to specific hardware and software.	x	x	x	x	x	x	x	x	x
COP.4.1.4	Organize and maintain directories and files using various operating environments.	x	x	x	x	x	x	x	x	x
COP.4.1.5	Describe emerging operating systems technology.	x	x	x	x	x	x	x	x	x
COP.4.1.6	Compare and contrast the functions and features of different operating systems, environments, and utilities.	x	x	x	x	x	x	x	x	x
COP.4.1.7	Install and customize operating systems, environments, and utilities.	x	x	x	x	x	x	x	x	x
COP.4.1.8	Diagnose and repair installation and operational problems of operating systems, environments, and utilities.	x	x	x	x	x	x	x	x	x
	Database Management Systems									
	INSPIRE>Links>Business>IndustryLink									
	Standard 5.1: ***Enter, sort, and retrieve data from databases; evaluate media and file structures; and plan, develop, and modify file specifications and database schema.***									
COP.5.1.1	Explain the nature and interrelationships of bytes, fields, records, files, and databases.	x	x	x						
COP.5.1.2	Populate (enter data into) and edit fields and records.	x	x	x			x		x	
COP.5.1.3	Sort and retrieve data from files and databases.	x	x	x		x	x		x	
COP.5.1.4	Identify storage media.	x	x	x					x	
COP.5.1.5	Plan and develop record specifications.	x	x	x	x	x	x	x	x	
COP.5.1.6	Develop organized database for output.	x	x	x	x	x	x	x	x	
COP.5.1.7	Modify record structures.	x	x	x			x		x	
COP.5.1.8	Explain, compare, and contrast sequential, direct, and indexed sequential file structures.	x	x	x	x	x	x		x	
	Web Site Development and Internet/Intranet Access									
	INSPIRE>EBSCO HOST>Business Source									
	Standard 6.1: ***Use, select, evaluate, install, customize, plan, design, develop, diagnose, and solve problems with on-line communications.***									
COP.6.1.1	Access, navigate, and use on-line services.	x	x	x	x		x	x	x	
COP.6.1.2	Send and receive e-mail messages, voice messages, and faxes.	x	x	x	x	x	x	x	x	x
COP.6.1.3	Identify the types of communications hardware and explain their functions and use.	x	x	x	x	x	x	x	x	x
COP.6.1.4	Select communications hardware appropriate for specific tasks.	x	x	x	x	x	x	x	x	
COP.6.1.5	Identify the types of communications software and explain their functions and use.	x	x	x	x	x	x	x	x	
COP.6.1.6	Select communications software appropriate for specific tasks.	x	x	x	x	x	x	x	x	
COP.6.1.7	Identify and explain various types of on-line services.	x	x	x	x	x	x	x	x	
COP.6.1.8	Develop, deploy, and maintain a Web Site.	x	x	x	x	x	x	x	x	x
COP.6.1.9	Explain network topologies and compare their strengths and weaknesses.	x	x	x	x	x	x	x	x	x
COP.6.1.10	Identify and explain major protocol standards.	x	x	x	x	x	x	x	x	x
COP.6.1.11	Demonstrate knowledge of Intranet and Internet communications systems.	x	x	x	x	x	x	x	x	x
COP.6.1.12	Maintain and manage networks and communications systems and work toward certification.	x	x	x	x	x	x	x	x	x
COP.6.1.13	Identify and describe the different components of the telecommunications industry.	x	x	x	x	x	x	x	x	x
COP.6.1.14	Work toward advanced industry specific certification.	x	x	x	x	x	x	x	x	x

	Information Systems Planning and Acquisition									
	INSPIRE>Links>Business>American City Business Journals									
	Standard 7.1: *Plan the selection, upgrade, and acquisition of information systems.*									
COP.7.1.1	Identify user needs for information systems.	x	x	x	x	x	x	x	x	x
COP.7.1.2	Identify sources for information systems hardware and software.	x	x	x	x	x	x	x	x	x
COP.7.1.3	Identify, compare, and contrast optional designs for an information system including costs and benefits for each option.	x	x	x	x	x	x	x	x	x
COP.7.1.4	Develop a request or proposal for an information system.	x	x	x	x	x	x	x	x	x
COP.7.1.5	Develop a project plan for identifying, evaluating, selecting, purchasing, and installing an information system.	x	x	x	x	x	x	x	x	x
	Systems Analysis and Design									
	INSPIRE>Indiana Links>Business>Indiana Business Magazine									
	Standard 8.1: *Analyze and design information systems using appropriate development tools.*									
COP.8.1.4	Identify and explain the steps in the systems' development life cycle.	x	x	x	x	x	x	x	x	x
COP.8.1.5	Develop design specifications for reports, screens, and data storage.	x	x	x	x	x	x	x	x	x
COP.8.1.6	Identify and describe various structured analysis and design tools.	x	x	x	x	x	x	x	x	x
COP.8.1.7	Using structured systems analysis tools, analyze the current system.	x	x	x	x	x	x	x	x	x
COP.8.1.8	Using structured systems analysis tools, define the system requirements.	x	x	x	x	x	x	x	x	x
COP.8.1.9	Develop a training plan for users.	x	x	x	x	x	x	x	x	x
COP.8.1.10	Complete appropriate documentation for information systems.	x	x	x	x	x	x	x	x	x
COP.8.1.11	Explain CASE and rapid application development tools.	x	x	x	x	x	x	x	x	x
COP.8.1.12	Develop a conversion plan.	x	x	x	x	x	x	x	x	x
COP.8.1.13	Use project management tools to manage information systems development projects.	x	x	x	x	x	x	x	x	x
	Programming.									
	INSPIRE>Indiana Links>Business>Indiana Business Review									
	Standard 9.1: *Compare, evaluate, and demonstrate skills in the use of different types and levels of programming language.*									
COP.9.1.1	Identify, compare, and contrast the types and levels of programming languages.	x	x	x	x	x	x	x	x	x
COP.9.1.2	Identify, explain, and utilize structured programming techniques.	x	x	x	x	x	x	x	x	x
COP.9.1.3	Differentiate between source and object code.	x	x	x						
COP.9.1.4	Develop programs in a procedural and event-driven/object-oriented program languages using the following (but not limited too these).	x	x	x	x	x	x	x	x	x
	- Create code for common tasks, such as creating, adding, deleting, sorting, and updating records.									
	- Create code for printing reports.									
	- Test and debug code.									
	- Maintain and re-engineer existing code.									
COP.9.1.5	Work toward advanced industry specific certification.	x	x	x	x	x	x	x	x	x
	Information Systems Security									
	INSPIRE>EBSCO Host>MasterFILE									
	Standard 10.1: *Design and/or implement security plans and procedures for information* .									
COP.10.1.1	Identify risks to information systems facilities, data, communications systems, and applications.	x	x	x	x	x	x	x	x	x
COP.10.1.2	Develop and apply procedures used to restart and recover from situations such as system failure, viral infection, and external factors.	x	x	x	x	x	x	x	x	x
	The Social, Ethical, and Economic Impact of Information Systems									
	INSPIRE>EBSCO Host>Academic Search									
	Standard 11.1: *Assess the social, ethical, and economic impact of information systems on society.*									
COP.11.1.1	Describe how information systems have fostered greater interdependence among workers, organizations, and nations.	x	x	x	x	x	x	x	x	x

COP.11.1.2	Describe how information systems have changed organizational structures.	x	x	x	x	x	x	x	x	x
COP.11.1.3	Describe how information systems have transformed business processes and relationships.	x	x	x	x	x	x	x	x	x
COP.11.1.4	Describe how information systems have changed the manner in which training is offered and implemented.	x	x	x	x	x	x	x	x	x
COP.11.1.5	Explain how information systems have contributed to worker productivity.	x	x	x	x	x	x	x	x	x
COP.11.1.6	Identify and explain property, privacy, access, and accuracy issues pertaining to information systems, including the impact of these issues on individuals and organizations.	x	x	x	x	x	x	x	x	x
COP.11.1.7	Identify federal and state legislation pertaining to computer crime, fraud, and abuse.	x	x	x	x	x	x	x	x	x
COP.11.1.8	Develop a code of ethics for a given information system.	x	x	x	x	x	x	x	x	x
	Information Systems Careers									
	INSPIRE>Links>Jobs & Careers									
	Standard 12.1: ***Describe positions and career paths in information systems.***									
COP.12.1.1	Identify positions and career paths in the field of information systems.	x	x	x	x	x	x	x	x	x
COP.12.1.2	Identify common tasks performed by information system workers.	x	x	x	x	x	x	x	x	x
COP.12.1.3	Describe education, experience, skills, and personal requirements for careers in information systems.	x	x	x	x	x	x	x	x	x
COP.12.1.4	Recognize the impact of technological change on information systems positions and the resulting need for life-long learning and retraining.	x	x	x	x	x	x	x	x	x
	Networking Hardware/Software									
	INSPIRE>Links>Busniess>International Business									
	Standard 13.1: ***Evaluate and use available hardware and software resources to design, implement, maintain, and administer computer/communications network systems.***									
COP.12.1.1	Use appropriate networking terminology and explain concepts specific to networking hardware, including the OSI network model and common network protocols/standards.	x	x	x	x		x	x	x	x
COP.12.1.2	Explain and use various network media, connections, connectors, tools , and test equipment to establish reliable network connections.	x	x	x	x		x	x	x	x
COP.12.1.3	List, describe, use, and configure appropriate Internetworking hardware devices for optimum network efficiency, including hubs, bridges, switches, routers, network interface cards, and modems.	x	x	x	x		x	x	x	x
COP.12.1.4	List, explain, and observe various local, state, and federal safety and building codes/regulations.	x	x	x	x	x	x	x	x	x
COP.12.1.5	Compare and contrast the functions and features of different networking operating systems.	x	x	x			x			
COP.12.1.6	Analyze, select, install, and manage appropriate network software on server.	x	x	x	x	x	x	x	x	x
COP.12.1.7	Analyze, select, and install appropriate client software on workstations or desktop computers.	x	x	x	x	x	x	x	x	x
COP.12.1.8	Plan, customize, configure, manage, and implement network objects.	x	x	x	x	x	x	x	x	x
COP.12.1.9	Complete a training program to gain industry specific Network Administration Certification.	x	x	x	x	x	x	x	x	x
COP.12.1.10	Recover server resources from a disaster.	x	x	x	x	x	x	x	x	x

INDICATOR NUMBER	CORRELATION OF THE INFORMATION LITERACY STANDARDS AND INDIANA'S ACADEMIC STANDARDS FOR BUSINESS SERVICES AND TECHNOLOGY EDUCATION INFORMATION TECHNOLOGY: NETWORK SYSTEMS; PROGRAMMING AND SOFTWARE DEVELOPMENT; INFORMATION SUPPORT AND SERVICES; AND INTERACTIVE MEDIA RELEASE DATE 2001	ILS 1 ACCESSES INFORMATION	ILS 2 EVALUATES INFORMATION	ILS 3 USES INFORMATION	ILS 4 PURSUES INFORMATION	ILS 5 APPRECIATES INFORMATION	ILS 6 GENERATES KNOWLEDGE	ILS 7 RECOGNIZES IMPORTANCE OF INFO TO DEMOCRATIC SOCIETY	ILS 8 PRACTICES ETHICAL BEHAVIOR	ILS 9 SHARES AND COLLABORATES
	Information Technology Basics									
	INSPIRE>EBSCO Host>MasterFILE									
	Standard 1.1: *Demonstrate basic knowledge of the history of information technology.*									
IT.1.1.1	Demonstrate knowledge of significant advances in the development of computer hardware and software.	x	x	x					x	
IT.1.1.2	Demonstrate knowledge of major milestones in the development of information technology.	x	x	x					x	
IT.1.1.3	Demonstrate knowledge of major individuals and their contributions to the information technology field.	x	x	x					x	
IT.1.1.4	Demonstrate knowledge of the speed with which computer technology has evolved (i.e., evolution time line).	x	x	x					x	
IT.1.1.5	Demonstrate knowledge of the role of data transmission in media, signaling techniques, transmission, and impairments.	x	x	x					x	
	Standard 1.2: *Demonstrate knowledge of the impact of information technology on society.*									
IT.1.2.1	Demonstrate knowledge of how both PCs and larger computer systems impact people and are used in business/industry/government and other institutions.	x	x	x					x	
IT.1.2.2	Demonstrate knowledge of the impact of computers on career pathways in business/industry (e.g. how computers have eliminated and created jobs).	x	x	x				x	x	
IT.1.2.3	Demonstrate knowledge of the psychological and health risks associated with computers.	x	x	x				x	x	
IT.1.2.4	Demonstrate knowledge of security risks and associated safeguards.	x	x	x				x	x	
IT.1.2.5	Demonstrate knowledge of the possible effects of natural disasters on computers.	x	x	x				x	x	
IT.1.2.6	Demonstrate knowledge of international telecommunications standards and trends.	x	x	x				x	x	
IT.1.2.7	Demonstrate knowledge of the impact of computers on access to information and information exchange worldwide.	x	x	x				x	x	
IT.1.2.8	Identify issues and trends affecting computers and information privacy.	x	x	x				x	x	
IT.1.2.9	Demonstrate knowledge of ethical issues that have surfaced in the information age.	x	x	x				x	x	
IT.1.2.10	Demonstrate knowledge of how information technology affects the natural environment (e.g. disposal of equipment, energy use, use of natural resources).	x	x	x				x	x	
	Standard 1.3: *Demonstrate knowledge of the hardware components associated with information systems .*									
IT.1.3.1	Identify the three main classifications of computers (i.e., micro-, mid-range, and mainframes).	x	x	x					x	
IT.1.3.2	Identify the elements of the information processing cycle (i.e., input, process, output, and storage).	x	x	x					x	
IT.1.3.3	Identify major hardware components and their functions.	x	x	x					x	
IT.1.3.4	Identify types of computer storage devices.	x	x	x					x	
IT.1.3.5	Identify types of processing (e.g., batch, interactive, event-driven, object-oriented).	x	x	x					x	
IT.1.3.6	Identify major operating system fundamentals and components.	x	x	x					x	
IT.1.3.7	Identify the role of binary system in information systems.	x	x	x					x	
IT.1.3.8	Demonstrate knowledge of number systems and internal data representation.	x	x	x					x	

IT.1.3.9	Identify the hardware associated with telecommunications functions.	x	x	x					x	
IT.1.3.10	Access needed information using company and manufacturers' references (e.g., procedural manuals, documentation, standards, work flowcharts).	x	x	x				x		
	Standard 1.4: *Demonstrate knowledge of the classes of software associated with information systems* .									
IT.1.4.1	Demonstrate knowledge of the key functions of systems software.	x	x	x						
IT.1.4.2	Demonstrate knowledge of widely used software applications (e.g., word processing, database management, spreadsheet development).	x	x	x				x		
IT.1.4.3	Demonstrate knowledge of the range of languages used in software development.	x	x	x				x		
IT.1.4.4	Demonstrate knowledge of how data is organized in software development.	x	x	x				x		
IT.1.4.5	Identify new and emerging types of software.	x	x	x				x		
	Standard 1.5: *Identify career opportunities in information systems.*									
IT.1.5.1	Identify entry-level positions.	x	x	x	x		x			
IT.1.5.2	Identify possible career pathways.	x	x	x	x	x	x	x	x	x
IT.1.5.3	Identify types of programmer/analyst positions available and the nature of each.	x	x	x	x		x		x	
IT.1.5.4	Identify types of administration/management positions available and the nature of each.	x	x	x	x		x		x	
IT.1.5.5	Identify present and future employment opportunities (by geographic location).	x	x	x	x		x		x	
IT.1.5.6	Research job opportunities.	x	x	x	x	x	x	x	x	x
IT.1.5.7	Compare salary ranges and benefit packages.	x	x	x	x	x	x	x	x	x
IT.1.5.8	Compile occupational profile.	x	x	x	x	x	x	x	x	x
IT.1.5.9	Identify certification issues within a particular career path.	x	x	x	x	x	x	x	x	x
IT.1.5.10	Identify education and training requirements for selected career pathway.	x	x	x	x	x	x	x	x	x
IT.1.5.11	Design a career ladder for own career in information technology (i.e., personal goal-setting).	x	x	x	x	x	x	x	x	x
IT.1.5.12	Design a time line for own career advancement in the information technology field.	x	x	x	x	x	x	x	x	x
IT.1.5.13	Identify professional organizations in the area of information technology.	x	x	x	x	x	x	x	x	x
IT.1.5.14	Identify benefits derived from membership in specific professional organizations.	x	x	x	x	x	x	x	x	x
IT.1.5.15	Job shadowing/internship by interest.	x	x	x	x	x	x	x	x	x
	Standard 1.6: *Explore the future of information technologies.*									
IT.1.6.1	Identify new technologies relevant to information technology.	x	x	x	x	x	x	x	x	x
IT.1.6.2	Measure increases in productivity realized by the implementation of information systems.	x	x	x	x	x	x	x	x	x
IT.1.6.3	Assess the importance of new technologies to future developments and to the future knowledge worker productivity.	x	x	x	x	x	x	x	x	x
IT.1.6.4	Identify new and emerging drivers and inhibitors of information technology change.	x	x	x	x	x	x	x	x	x
	Computer Applications									
	INSPIRE>EBSCO HOST>Business Source									
	Standard 2.1: *Create documents using word processing soft* ware.									
IT.2.1.1	Demonstrate proficiency in keyboarding skills.	x	x	x						
IT.2.1.2	Retrieve existing documents.	x	x	x						
IT.2.1.3	Create documents (e.g., letters, memos, reports) using existing forms and templates.	x	x	x	x	x	x	x	x	x
IT.2.1.4	Safeguard documents using name and save functions.	x	x	x					x	
IT.2.1.5	Format text using basic formatting functions (e.g., page setup, tabs, bullets, page numbers, font enhancements, cut and paste).	x	x	x					x	
IT.2.1.6	Check documents using print preview functions.	x	x	x					x	
IT.2.1.7	Locate/replace text using search and replace functions.	x	x	x					x	
IT.2.1.8	Create new word processing forms, style sheets, and templates.	x	x	x	x	x	x	x	x	x
IT.2.1.9	Employ word processing utility tools (e.g., spell checker, grammar checker, thesaurus).	x	x	x					x	
IT.2.1.10	Create tables using table functions (e.g., setup, formatting, editing).	x	x	x	x	x	x	x	x	x
IT.2.1.11	Create columns using column functions (e.g., setup, formatting, editing).	x	x	x	x	x	x	x	x	x

IT.2.1.12	Create outlines.	x	x	x	x	x	x	x	x	x
IT.2.1.13	Create footnotes and endnotes.	x	x	x	x	x	x	x	x	x
IT.2.1.14	Create macros.	x	x	x	x	x	x	x	x	x
IT.2.1.15	Run macros.	x	x	x					x	
IT.2.1.16	Assemble documents using merge functions (e.g., merge address files with letters and envelopes).	x	x	x	x	x	x	x	x	x
IT.2.1.17	Format text using advanced formatting features (e.g., headers/footers/dropped caps, indexing).	x	x	x	x	x	x	x	x	x
IT.2.1.18	Print materials using print functions (e.g., number of copies, duplexing or one-sided, selected pages or whole document).	x	x	x						
IT.2.1.19	Verify accuracy of output.	x	x	x						
IT.2.1.20	Edit documents.	x	x	x						
IT.2.1.21	Access needed information using word processing help screens.	x	x	x						
IT.2.1.22	Use a variety of input technologies including speech and handwriting recognition.	x	x	x			x			
	Standard 2.2: *Create relational databases* .									
IT.2.2.1	Design a simple database in accordance with written and/or oral specifications.	x	x	x	x	x	x	x	x	x
IT.2.2.2	Create a database table.	x	x	x	x	x	x	x	x	x
IT.2.2.3	Edit the design of a database table.	x	x	x					x	
IT.2.2.4	Edit the content of a database table (e.g., add, delete, and modify records).	x	x	x	x	x	x	x	x	x
IT.2.2.5	Search a table to locate records.	x	x	x						
IT.2.2.6	Sort data in a single field.	x	x	x						
IT.2.2.7	Enter data using a form.	x	x	x	x	x	x	x	x	x
IT.2.2.8	Create/modify a form.	x	x	x	x	x	x	x	x	x
IT.2.2.9	Perform single- and multiple-table queries (e.g., create, run, save).	x	x	x	x	x	x	x	x	x
IT.2.2.10	Create calculated fields.	x	x	x	x	x	x	x	x	x
IT.2.2.11	Generate customized reports for database files.	x	x	x	x	x	x	x	x	x
IT.2.2.12	Process data using database functions (e.g., structure, format, attributes, relationships, and keys).	x	x	x	x	x	x	x	x	x
IT.2.2.13	Locate/replace data using search and replace functions.	x	x	x						
IT.2.2.14	Print forms, reports, and results of queries.	x	x	x						
IT.2.2.15	Verify accuracy of output.	x	x	x						
IT.2.2.16	Sort data using multiple-field sorts.	x	x	x						
IT.2.2.17	Add/remove filters.	x	x	x						
IT.2.2.18	Create multiple criteria expressions.	x	x	x						
IT.2.2.19	Create adjoined files.	x	x	x						
IT.2.2.20	Index files.	x	x	x						
IT.2.2.21	Create subforms.	x	x	x	x	x	x	x	x	x
IT.2.2.22	Group data in reports.	x	x	x						
IT.2.2.23	Create graphs.	x	x	x	x	x	x	x	x	x
IT.2.2.24	Alter the appearance of a form by adding objects or properties.	x	x	x			x		x	
IT.2.2.25	Identify the relationship among database components.	x	x	x			x		x	
IT.2.2.26	Design a database to meet the needs of an actual situation or business problem.	x	x	x	x	x	x	x	x	x
IT.2.2.27	Evaluate database design and functionality.	x	x	x	x	x	x	x	x	x
	Standard 2.3: *Create spreadsheets* .									
IT.2.3.1	Design a spreadsheet in accordance with written and/or oral specifications.	x	x	x	x	x	x	x	x	x
IT.2.3.2	Create spreadsheets.	x	x	x	x	x	x	x	x	x
IT.2.3.3	Retrieve existing spreadsheets.	x	x	x					x	
IT.2.3.4	Check spreadsheets using print preview functions.	x	x	x					x	

IT.2.3.5	Format spreadsheets using basic formatting functions (e.g., page setup).	x	x	x			x			
IT.2.3.6	Perform calculations using simple formulas.	x	x	x			x			
IT.2.3.7	Edit spreadsheets.	x	x	x			x		x	
IT.2.3.8	Create charts and graphs from spreadsheets.	x	x	x	x	x	x	x	x	x
IT.2.3.9	Group worksheets.	x	x	x			x		x	
IT.2.3.10	Delete within spreadsheets.	x	x	x					x	
IT.2.3.11	Move/copy within spreadsheets.	x	x	x					x	
IT.2.3.12	Input/process data using spreadsheet functions.	x	x	x					x	
IT.2.3.13	Improve spreadsheet display using enhancement features.	x	x	x			x		x	
IT.2.3.14	Protect data using spreadsheet protection features.	x	x	x			x		x	
IT.2.3.15	Record macros.	x	x	x			x		x	
IT.2.3.16	Run macros.	x	x	x					x	
IT.2.3.17	Troubleshoot spreadsheet problems.	x	x	x						
IT.2.3.18	Resolve function errors as needed.	x	x	x						
IT.2.3.19	Apply advanced spreadsheet formulas.	x	x	x			x		x	
IT.2.3.20	Create spreadsheet solutions to business problems.	x	x	x	x	x	x	x	x	x
IT.2.3.21	Make "*what if* -" business decisions using spreadsheets as a tool.	x	x	x			x		x	
IT.2.3.22	Save spreadsheets.	x	x	x					x	
IT.2.3.23	Access needed information using online help features.	x	x	x	x	x	x	x	x	
IT.2.3.24	Print spreadsheets.	x	x	x					x	
	Standard 2.4: *Perform desktop publishing functions.*									
IT.2.4.1	Prepare publications using desktop publishing software.	x	x	x	x	x	x	x	x	x
IT.2.4.2	Format new desktop publishing files.	x	x	x	x	x	x	x	x	x
IT.2.4.3	Enter information directly into document.	x	x	x		x	x		x	
IT.2.4.4	Place preformatted text into document.	x	x	x			x		x	
IT.2.4.5	Place graphics in document.	x	x	x		x	x		x	
IT.2.4.6	Employ draw boxes.	x	x	x						
IT.2.4.7	Create graphics files using clip art.	x	x	x	x	x	x	x	x	x
IT.2.4.8	Import scanned files.	x	x	x	x	x	x	x	x	x
IT.2.4.9	Enhance publications using different fonts, styles, attributes, justification, etc..	x	x	x			x			
IT.2.4.10	Enhance publications using paint/draw functions.	x	x	x	x	x	x	x	x	x
IT.2.4.11	Create two-sided documents.	x	x	x	x	x	x	x	x	x
IT.2.4.12	Perform editing functions.	x	x	x						
IT.2.4.13	Set up master pages.	x	x	x		x				
IT.2.4.14	Output desktop publishing files.	x	x	x						
	Standard 2.5: *Create presentations using presentation graphics software* .									
IT.2.5.1	Identify hardware items that support presentation software (e.g., scanners, digital cameras, printers, and projection systems).	x	x	x			x			
IT.2.5.2	Compare/contrast various presentation software packages.	x	x	x			x			
IT.2.5.3	Create computer presentation and handouts in accordance with basic principles of graphics design and visual communication.	x	x	x	x	x	x	x	x	x
IT.2.5.4	Edit presentations.	x	x	x						
IT.2.5.5	Copy from one presentation to another.	x	x	x						
IT.2.5.6	Print a single slide, an entire presentation, an outline, and notes.	x	x	x						
IT.2.5.7	Insert clip art in a slide.	x	x	x						

IT.2.5.8	Create word art objects.	x	x	x						
IT.2.5.9	Insert word art objects.	x	x	x						
IT.2.5.10	Create/modify a graph on a slide.	x	x	x	x	x	x	x	x	x
IT.2.5.11	Add a template to a presentation.	x	x	x					x	
IT.2.5.12	Remove a template from a presentation.	x	x	x					x	
IT.2.5.13	Create graphics documents using drawing and painting software programs.	x	x	x	x	x	x	x	x	x
IT.2.5.14	Add transitions to slide shows.	x	x	x					x	
IT.2.5.15	Run slide shows manually and automatically.	x	x	x					x	
IT.2.5.16	Save slide show presentations.	x	x	x					x	
	Standard 2.6: *Integrate computer applications* .									
IT.2.6.1	Analyze problems requiring solutions involving the integration of computer applications.	x	x	x	x	x	x	x	x	x
IT.2.6.2	Select appropriate productivity tool for solving specific problem.	x	x	x	x	x	x	x	x	x
IT.2.6.3	Select *source* application and *destination* application.	x	x	x					x	
IT.2.6.4	Move/copy information between integrated applications.	x	x	x					x	
IT.2.6.5	Link objects between applications.	x	x	x					x	
IT.2.6.6	Embed information in applications.	x	x	x					x	
	Data Communications									
	INSPIRE>Links>Business>IndustryLink									
	Standard 3.1: *Demonstrate knowledge of basic data communications components and trends.*									
IT.3.1.1	Demonstrate knowledge of key communications procedures.	x	x	x					x	
IT.3.1.2	Demonstrate knowledge of the uses of data communication equipment.	x	x	x					x	
IT.3.1.3	Demonstrate knowledge of types of communications media.	x	x	x					x	
IT.3.1.4	Demonstrate knowledge of data transmission codes and protocols.	x	x	x					x	
IT.3.1.5	Distinguish between local area networks and wide-area networks.	x	x	x					x	
IT.3.1.6	Identify data communication trends.	x	x	x	x	x	x	x	x	x
IT.3.1.7	Identify major current issues in data communications.	x	x	x	x	x	x	x	x	x
IT.3.1.8	Demonstrate knowledge of the role telecommunication networks play in the contemporary business environment.	x	x	x	x	x	x	x	x	x
	Standard 3.2: *Access information using electronic sources* .									
IT.3.2.1	Demonstrate knowledge of how to conduct searches using electronic sources (e.g., selection of search terms).	x	x	x	x	x	x	x	x	x
IT.3.2.2	Access information using telecommunications software.	x	x	x	x	x	x	x	x	x
IT.3.2.3	Access information using teleconferencing/video conferencing techniques.	x	x	x	x	x	x	x	x	x
IT.3.2.4	Access information using CD-ROM technology.	x	x	x	x	x	x	x	x	x
IT.3.2.5	Demonstrate knowledge of the uses of virtual reality as an information source.	x	x	x	x	x	x	x	x	x
IT.3.2.6	Access information using a public information retrieval service.	x	x	x	x	x	x	x	x	x
IT.3.2.7	Evaluate the quality and usability of electronic information.	x	x	x	x	x	x	x	x	x
IT.3.2.8	Download information.	x	x	x	x	x	x	x	x	x
	Standard 3.3: *Demonstrate proficiency with electronic mail.*									
IT.3.3.1	Demonstrate knowledge of the basic purposes of e-mail systems.	x	x	x						
IT.3.3.2	Demonstrate knowledge of basic e-mail features and options.	x	x	x						
IT.3.3.3	Demonstrate knowledge of security issues and guidelines for legal usage of e-mail.	x	x	x	x	x	x	x	x	x
IT.3.3.4	Demonstrate knowledge of contamination protection strategies for e-mail.	x	x	x	x	x	x	x	x	x
IT.3.3.5	Identify available e-mail systems and the characteristics/features of each.	x	x	x	x	x	x	x	x	x
IT.3.3.6	Access e-mail system using login and password functions.	x	x	x					x	
IT.3.3.7	Access e-mail messages received.	x	x	x					x	
IT.3.3.8	Access e-mail attachments.	x	x	x					x	

IT.3.3.9	Demonstrate knowledge of e-mail etiquette.	x	x	x	x	x	x	x	x	x
IT.3.3.10	Create e-mail messages in accordance with established business standards (e.g., grammar, word usage, spelling, sentence structure, clarity, e-mail etiquette).	x	x	x	x	x	x	x	x	x
IT.3.3.11	Send e-mail messages.	x	x	x	x	x	x	x	x	x
IT.3.3.12	Assign priority levels to messages.	x	x	x					x	
IT.3.3.13	Create distribution lists.	x	x	x			x		x	
IT.3.3.14	Employ e-mail options such as "reply requested" and "out-of-office reply".	x	x	x			x		x	
IT.3.3.15	Reply to e-mail messages.	x	x	x					x	
IT.3.3.16	Forward e-mail messages.	x	x	x					x	
IT.3.3.17	Attach documents to messages.	x	x	x					x	
IT.3.3.18	Create folders for organizing messages and documents.	x	x	x					x	
IT.3.3.19	Save e-mail messages/attachments.	x	x	x					x	
IT.3.3.20	Delete e-mail messages.	x	x	x					x	
IT.3.3.21	Print e-mail messages/attachments.	x	x	x					x	
IT.3.3.22	Access needed information using e-mail help facilities and tools.	x	x	x					x	
	Programming Theory									
	INSPIRE>Links>Business>Marketing Research									
	Standard 4.1: *Demonstrate knowledge of programming language concepts.*									
IT.4.1.1	Demonstrate knowledge of the concept of physical representation of digitized information (e.g., data, text, image, voice).	x	x	x					x	
IT.4.1.2	Demonstrate knowledge of the hardware-software connection.	x	x	x					x	
IT.4.1.3	Demonstrate knowledge of the concepts of data and procedural representation.	x	x	x					x	
IT.4.1.4	Analyze programming languages.	x	x	x	x	x	x	x	x	x
IT.4.1.5	Demonstrate knowledge of the function and operation of compilers and interpreters.	x	x	x					x	
IT.4.1.6	Demonstrate knowledge of the basic principles for analyzing a programming language.	x	x	x					x	
IT.4.1.7	Demonstrate knowledge of the basics of structured, object-oriented, and event-driven programming.	x	x	x					x	
IT.4.1.8	Demonstrate knowledge of how a programming language can support multitasking and exception-handling.	x	x	x					x	
IT.4.1.9	Demonstrate knowledge of current key programming languages and the environment they are used in (e.g., C, C++, Visual Basic, Java, RPG, COBOL, Assembler).	x	x	x					x	
	Standard 4.2: *Apply the process of algorithm and structured code development.*									
IT.4.2.1	State a problem identifying desired outputs for given inputs.	x	x	x					x	
IT.4.2.2	Provide an overview of problem to be solved.	x	x	x					x	
IT.4.2.3	Describe the fundamental data types and their operations.	x	x	x					x	
IT.4.2.4	Design program logic using both graphical and pseudocode techniques.	x	x	x	x	x	x	x	x	x
IT.4.2.5	Translate data structures and program design into code in a programming language.	x	x	x	x	x	x	x	x	x
IT.4.2.6	Perform mathematical calculations using operators.	x	x	x	x	x	x	x	x	x
	Standard 4.3: *Demonstrate knowledge of the stages of program development.*									
IT.4.3.1	Identify the use of program design tools.	x	x	x					x	
IT.4.3.2	Demonstrate knowledge of structured/modular programming.	x	x	x					x	
IT.4.3.3	Demonstrate knowledge of the information system (IS) life cycle.	x	x	x					x	
IT.4.3.4	Demonstrate knowledge of the characteristics and uses of batch processing.	x	x	x					x	
IT.4.3.5	Demonstrate knowledge of the characteristics and uses of interactive processing.	x	x	x					x	
IT.4.3.6	Demonstrate knowledge of the characteristics and uses of event-driven, object-oriented processing.	x	x	x					x	
	Standard 4.4: *Demonstrate knowledge of technical documentation associated with software development.*									
IT.4.4.1	Secure needed information using appropriate reference materials.	x	x	x	x	x	x	x	x	x

IT.4.4.2	Analyze specifications.	x	x	x					x	
IT.4.4.3	Identify constraints.	x	x	x					x	
IT.4.4.4	Identify input and output (I/O) requirements.	x	x	x					x	
IT.4.4.5	Prepare logic using a program flowchart.	x	x	x	x	x	x	x	x	
	Applied Programming Languages									
	INSPIRE>Links>Business>International Business									
	Standard 5.1: *Apply computational and logical operations.*									
IT.5.1.1	Develop programs that use arithmetic operations.	x	x	x	x	x	x	x	x	
IT.5.1.2	Develop programs that use relational operators and compound conditions.	x	x	x	x	x	x	x	x	
IT.5.1.3	Develop programs that use control breaks.	x	x	x	x	x	x	x	x	
IT.5.1.4	Develop programs that use subtotals and final totals.	x	x	x	x	x	x	x	x	
	Standard 5.2: *Apply techniques for building applications* .									
IT.5.2.1	Demonstrate knowledge of development environment.	x	x	x						
IT.5.2.2	Use editors.	x	x	x						
IT.5.2.3	Compile or interpret applications into runable form.	x	x	x	x	x	x	x	x	
IT.5.2.4	Run application.	x	x	x						
	Standard 5.3: *Apply language specific programming techniques* .									
IT.5.3.1	Develop programs using desired language.	x	x	x	x	x	x	x	x	
IT.5.3.2	Incorporate the use of sort routines.	x	x	x						
IT.5.3.3	Develop programs designed to create, update, and delete records.	x	x	x	x	x	x	x	x	x
IT.5.3.4	Develop programs using menus.	x	x	x	x	x	x	x	x	x
IT.5.3.5	Develop programs that require user input.	x	x	x	x	x	x	x	x	x
IT.5.3.6	Demonstrate knowledge of key constructs and commands specific to the language.	x	x	x						
IT.5.3.7	Compile program.	x	x	x						
IT.5.3.8	Test program.	x	x	x						
IT.5.3.9	Correct errors.	x	x	x			x			
	Standard 5.4: *Debug programs.*									
IT.5.4.1	Test/run program.	x	x	x						
IT.5.4.2	Correct syntax errors.	x	x	x			x			
IT.5.4.3	Debug compiler errors.	x	x	x			x			
IT.5.4.4	Correct common run-time errors.	x	x	x			x			
IT.5.4.5	Debug complex logic errors.	x	x	x	x	x	x	x	x	x
IT.5.4.6	Maintain legacy applications.	x	x	x						
	Computer User Support									
	INSPIRE>EBSCO Host>Business Source									
	Standard 6.1: *Analyze technical support need* ed.									
IT.6.1.1	Identify support requirements.	x	x	x						
IT.6.1.2	Apply information and data analysis techniques.	x	x	x						
IT.6.1.3	Identify skill level needs.	x	x	x						
IT.6.1.4	Define scope of work to meet customer needs.	x	x	x	x	x	x	x	x	x
IT.6.1.5	Identify resources and risks.	x	x	x	x	x	x	x	x	
IT.6.1.6	Evaluate present data and system configuration.	x	x	x	x	x	x	x	x	
IT.6.1.7	Formulate a support plan.	x	x	x	x	x	x	x	x	x
IT.6.1.8	Communicate and document technical support provided.	x	x	x	x	x	x	x	x	x

	Standard 6.2: *Perform customer service.*									
IT.6.2.1	Provide high-level technical support.	x	x	x	x	x	x	x	x	x
IT.6.2.2	Respond to user questions.	x	x	x	x	x	x	x	x	x
IT.6.2.3	Provide troubleshooting for hardware/software.	x	x	x	x	x	x	x	x	x
IT.6.2.4	Track information within the system.	x	x	x	x	x	x	x	x	x
IT.6.2.5	Perform system-tuning functions.	x	x	x	x	x	x	x	x	x
IT.6.2.6	Diagnose problems within system.	x	x	x	x	x	x	x	x	x
IT.6.2.7	Perform technical functions required by customer/user.	x	x	x	x	x	x	x	x	x
IT.6.2.8	Employ technical and computer tools to perform task in the most cost-effective manner.	x	x	x	x	x	x	x	x	x
IT.6.2.9	Manage working relationships with customer within support boundaries.	x	x	x	x	x	x	x	x	x
IT.6.2.10	Balance resources against customer needs.	x	x	x	x	x	x	x	x	x
IT.6.2.11	Manage multiple customer requirements.	x	x	x	x	x	x	x	x	x
IT.6.2.12	Establish liaison communication with all users.	x	x	x	x	x	x	x	x	x
	Standard 6.3: *Provide support and training.*									
IT.6.3.1	Operate help desk.	x	x	x	x	x	x	x	x	x
IT.6.3.2	Employ desktop productivity tools.	x	x	x			x			
IT.6.3.3	Support computer users.	x	x	x	x	x	x	x	x	x
IT.6.3.4	Train computer users.	x	x	x	x	x	x	x	x	x
IT.6.3.5	Manage user accounts.	x	x	x	x	x	x	x	x	x
IT.6.3.6	Maintain documentation.	x	x	x	x	x	x	x	x	x
IT.6.3.7	Prepare status reports.	x	x	x	x	x	x	x	x	x
IT.6.3.8	Maintain training manuals.	x	x	x	x	x	x	x	x	x
	Software Development									
	INSPIRE>EBSCO Host>Regional Business News									
	Standard 7.1: *Demonstrate knowledge of software development methodology* .									
IT.7.1.1	Identify basic concepts of algorithm development and programming.	x	x	x			x		x	
IT.7.1.2	Demonstrate knowledge of how to complete project (given formal specifications) requiring incorporation of control structures.	x	x	x			x		x	
IT.7.1.3	Demonstrate knowledge of the principles of program design (e.g., structured, object-oriented, event-driven).	x	x	x			x		x	
IT.7.1.4	Demonstrate knowledge of different data types (e.g., numeric, alphanumeric).	x	x	x			x		x	
IT.7.1.5	Demonstrate knowledge of the software design process (e.g., specification through implementation and testing).	x	x	x			x		x	
IT.7.1.6	Demonstrate knowledge of how to resolve program implementation issues (e.g., debugging, documentation, auditing).	x	x	x			x		x	
IT.7.1.7	Demonstrate knowledge of software development issues (e.g., correctness, reliability, and productivity).	x	x	x			x		x	
IT.7.1.8	Demonstrate knowledge of the system life-cycle approach.	x	x	x			x		x	
IT.7.1.9	Demonstrate knowledge of the use, structure, and contents of a requirements specification document.	x	x	x			x		x	
IT.7.1.10	Demonstrate knowledge of how to use a structured methodology to analyze a real-world problem.	x	x	x			x		x	
IT.7.1.11	Demonstrate knowledge of how dataflow diagrams, process specifications, and a data dictionary are used to model functional requirements.	x	x	x			x		x	
IT.7.1.12	Demonstrate knowledge of how Jackson diagrams, entity relationship diagrams, and relations are used to model data requirements.	x	x	x			x		x	
IT.7.1.13	Demonstrate knowledge of nonfunctional requirements (e.g., security, integrity, response time, and reliability).	x	x	x			x		x	
IT.7.1.14	Demonstrate knowledge of how to use computer-aided software engineering (CASE) tools.	x	x	x			x		x	
IT.7.1.15	Demonstrate knowledge of project budgeting, scheduling, and control issues related to software development.	x	x	x			x		x	
IT.7.1.16	Demonstrate knowledge of different system design models (e.g., client server, centralized).	x	x	x			x		x	
IT.7.1.17	Demonstrate knowledge of system analysis issues related to design, testing, implementation, and maintenance.	x	x	x			x		x	

IT.7.1.18	Demonstrate knowledge of how to design and implement programs in a top-down manner.	x	x	x			x		x	
IT.7.1.19	Demonstrate knowledge of how to use algorithmic and modular design to develop a problem solution.	x	x	x			x		x	
IT.7.1.20	Demonstrate knowledge of how concepts of modular design are used to define cohesive modules.	x	x	x			x		x	
IT.7.1.21	Demonstrate knowledge of how programming control structures are used to verify correctness.	x	x	x			x		x	
IT.7.1.22	Demonstrate knowledge of data normalization.	x	x	x			x		x	
IT.7.1.23	Demonstrate knowledge of memory management theories.	x	x	x			x		x	
IT.7.1.24	Demonstrate knowledge of Unified Modeling Language (UML).	x	x	x			x		x	
IT.7.1.25	Demonstrate knowledge of Extreme Programming (XP).	x	x	x			x		x	
IT.7.1.26	Demonstrate knowledge of best practices and design patterns.	x	x	x						
IT.7.1.27	Demonstrate knowledge of Unified Software Development Procedures (USDP).	x	x	x						
	Standard 7.2: Demonstrate knowledge of basic software systems design.									
IT.7.2.1	Access needed information using company and manufacturers' references (e.g., procedural manuals, documentation, standards, work flowcharts).	x	x	x	x	x	x	x	x	x
IT.7.2.2	Analyze documentation, forms, notes, and source data.	x	x	x	x	x	x	x	x	x
IT.7.2.3	Identify constraints.	x	x	x						
IT.7.2.4	Identify system processing requirements.	x	x	x						
IT.7.2.5	Identify input and output (I/O) requirements.	x	x	x						
IT.7.2.6	Design system inputs, outputs, and processes.	x	x	x						
IT.7.2.7	Prepare logic using program flowchart.	x	x	x						
IT.7.2.8	Define variables.	x	x	x						
IT.7.2.9	Select programming language.	x	x	x						
IT.7.2.10	Create design documentation.	x	x	x	x	x	x	x	x	x
IT.7.2.11	Prepare printer spacing chart.	x	x	x			x			
IT.7.2.12	Design implementation plan.	x	x	x	x	x	x	x	x	x
IT.7.2.13	Design project plan.	x	x	x	x	x	x	x	x	x
IT.7.2.14	Prepare dataflow diagram.	x	x	x	x	x	x	x	x	x
IT.7.2.15	Present system design to management.	x	x	x	x	x	x	x	x	x
IT.7.2.16	Present system design to users.	x	x	x	x	x	x	x	x	x
IT.7.2.17	Select computer-aided software engineering (CASE) tools.	x	x	x			x			
IT.7.2.18	Review design (e.g., peer and/or user walkthrough).	x	x	x			x			
	Standard 7.3: *Develop software requirements/specifications.*									
IT.7.3.1	Access needed information using company references (e.g., procedural manuals, documentation, standards, work flowcharts).	x	x	x	x	x	x	x	x	x
IT.7.3.2	Analyze requirements/specifications using current approaches (e.g., structured analysis, object-oriented analysis, prototyping,	x	x	x	x	x	x	x	x	x
IT.7.3.3	Divide design specifications into logical process blocks.	x	x	x			x			
IT.7.3.4	Identify parameters.	x	x	x						
IT.7.3.5	Clarify specifications using questioning techniques.	x	x	x						
IT.7.3.6	Follow specifications or drawings.	x	x	x						
IT.7.3.7	Record process (e.g., using flowchart, step-by-step narrative).	x	x	x						
IT.7.3.8	Record data.	x	x	x						
IT.7.3.9	Gather information using interviewing strategies.	x	x	x	x	x	x	x	x	x
IT.7.3.10	Identify system requirements.	x	x	x			x			
IT.7.3.11	Develop informal specifications.	x	x	x			x			
IT.7.3.12	Develop formal specifications.	x	x	x			x			
IT.7.3.13	Identify documentation needs.	x	x	x			x			

IT.7.3.14	Identify computing standards and methodologies.	x	x	x			x			
IT.7.3.15	Identify security measures.	x	x	x			x			
	Standard 7.4: *Code programs.*									
IT.7.4.1	Access needed information using company and manufacturers' references (e.g., procedural manuals, documentation, standards, work flowcharts).	x	x	x	x	x	x	x	x	x
IT.7.4.2	Prepare detailed flowchart for coding program.	x	x	x	x	x	x	x	x	x
IT.7.4.3	Design program solution using pseudocode, etc..	x	x	x	x	x	x	x	x	x
IT.7.4.4	Generate source code using programming tools in accordance with established standards (e.g., BASIC, COBOL, RPG, C).	x	x	x	x	x	x	x	x	x
IT.7.4.5	Code error-handling techniques.	x	x	x			x			
IT.7.4.6	Access data using external sequential, indexed sequential, random, and direct file methods.	x	x	x	x	x	x	x	x	
IT.7.4.7	Apply logical operators (e.g., AND, OR, NOT).	x	x	x						
IT.7.4.8	Perform program sorts.	x	x	x						
IT.7.4.9	Develop programs in higher-level languages (e.g., C++, Visual Basic).	x	x	x	x	x	x	x	x	x
IT.7.4.10	Generate executable code.	x	x	x			x			
IT.7.4.11	Debug compilation errors.	x	x	x			x			
IT.7.4.12	Review code with peers or design team.	x	x	x	x	x	x	x	x	x
IT.7.4.13	Apply security measures.	x	x	x	x	x	x	x	x	x
IT.7.4.14	Apply computer-aided software engineering (CASE) tools and reverse engineering.	x	x	x	x	x	x	x	x	
IT.7.4.15	Develop dataflow designs and translate them to pseudocode, etc..	x	x	x	x	x	x	x	x	
IT.7.4.16	Translate a logical system design into a physical design in a real environment.	x	x	x	x	x	x	x	x	x
IT.7.4.17	Report progress based on time line.	x	x	x	x	x	x	x	x	x
	Standard 7.5: *Execute software testing, validation, change control, error tracking, and documentation.*									
IT.7.5.1	Access needed information.	x	x	x						
IT.7.5.2	Develop comprehensive test plan.	x	x	x			x			
IT.7.5.3	Develop test system.	x	x	x			x			
IT.7.5.4	Develop test procedures.	x	x	x			x			
IT.7.5.5	Perform tests.	x	x	x						
IT.7.5.6	Document errors.	x	x	x						
IT.7.5.7	Perform regression tests.	x	x	x			x			
IT.7.5.8	Update design documentation.	x	x	x			x			
IT.7.5.9	Prepare program documentation.	x	x	x	x	x	x	x	x	x
IT.7.5.10	Prepare user documentation.	x	x	x	x	x	x	x	x	x
IT.7.5.11	Perform user-acceptance test.	x	x	x			x			
IT.7.5.12	Validate user documentation.	x	x	x			x			
IT.7.5.13	Review results with customer/user.	x	x	x	x	x	x	x	x	x
IT.7.5.14	Report progress based on time line.	x	x	x	x	x	x	x	x	x
	Standard 7.6: *Execute software product release and follow-up.*									
IT.7.6.1	Obtain user acceptance.	x	x	x	x	x	x	x	x	x
IT.7.6.2	Participate in development of release plan.	x	x	x	x	x	x	x	x	x
IT.7.6.3	Train technical support staff.	x	x	x	x	x	x	x	x	x
IT.7.6.4	Facilitate transition to the new system.	x	x	x	x	x	x	x	x	x
IT.7.6.5	Participate in development of a user training plan.	x	x	x	x	x	x	x	x	x
IT.7.6.6	Evaluate errors.	x	x	x						
IT.7.6.7	Repair errors.	x	x	x			x			

IT.7.6.8	Document errors and repairs.	x	x	x						
IT.7.6.9	Implement enhancements.	x	x	x			x			
IT.7.6.10	Evaluate enhancements.	x	x	x						
IT.7.6.11	Document enhancements.	x	x	x						
IT.7.6.12	Obtain user feedback.	x	x	x	x	x	x	x	x	x
IT.7.6.13	Evaluate users' concerns.	x	x	x	x	x	x	x	x	x
IT.7.6.14	Respond to users' concerns.	x	x	x	x	x	x	x	x	x
	Standard 7.7: *Complete team software engineering project.*									
IT.7.7.1	Demonstrate knowledge of the principles and applications of software development team organization.	x	x	x	x	x	x	x	x	x
IT.7.7.2	Gather data to identify customer requirements.	x	x	x	x	x	x	x	x	x
IT.7.7.3	Estimate product life or customer application.	x	x	x	x	x	x	x	x	x
IT.7.7.4	Evaluate functional requirements.	x	x	x						
IT.7.7.5	Interpret functional requirements analysis.	x	x	x			x			
IT.7.7.6	Define scope of work to meet customer requirements.	x	x	x	x	x	x	x	x	x
IT.7.7.7	Identify time, technology, and resource constraints.	x	x	x						
IT.7.7.8	Estimate project costs.	x	x	x						
IT.7.7.9	Apply project planning and scheduling techniques to project development.	x	x	x	x	x	x	x	x	x
IT.7.7.10	Generate design alternatives.	x	x	x	x	x	x	x	x	x
IT.7.7.11	Evaluate design alternatives.	x	x	x						
IT.7.7.12	Define system and software requirements.	x	x	x						
IT.7.7.13	Validate system requirements.	x	x	x						
IT.7.7.14	Establish measurable performance requirements.	x	x	x	x	x	x	x	x	x
IT.7.7.15	Develop software product and project documentation.	x	x	x	x	x	x	x	x	x
IT.7.7.16	Perform software product and project document composition and evaluation.	x	x	x	x	x	x	x	x	x
IT.7.7.17	Conduct software product testing and debugging.	x	x	x	x	x	x	x	x	x
IT.7.7.18	Conduct technical review.	x	x	x	x	x	x	x	x	x
	Standard 7.8: *Apply computer simulation techniques.*									
IT.7.8.1	Demonstrate knowledge of methods for comparing systems using random data.	x	x	x			x			
IT.7.8.2	Demonstrate knowledge of simulation techniques and the analysis of simulation results.	x	x	x			x			
IT.7.8.3	Demonstrate knowledge of experimental design techniques.	x	x	x			x			
IT.7.8.4	Develop experimental designs.	x	x	x	x	x	x	x	x	x
IT.7.8.5	Employ random number generation.	x	x	x			x			
IT.7.8.6	Demonstrate knowledge of random variate generation.	x	x	x			x			
IT.7.8.7	Demonstrate given simulations using a simulator.	x	x	x	x	x	x	x	x	x
IT.7.8.8	Apply queuing systems to a simulation.	x	x	x			x			
	Standard 7.9: *Demonstrate knowledge of data structures.*									
IT.7.9.1	Demonstrate knowledge of techniques for data abstraction.	x	x	x			x			
IT.7.9.2	Demonstrate knowledge of program design using abstraction.	x	x	x			x			
IT.7.9.3	Demonstrate knowledge of data structures (e.g., arrays and records, lists, trees, hashing, priority queues and heaps, equivalence relations, and graphs) as they apply to simulation.	x	x	x						
IT.7.9.4	Analyze mathematically the efficiency of algorithms that manipulate and use data structures in searching, sorting, dictionary operations, and graphing.	x	x	x						
IT.7.9.5	Estimate algorithm efficiency using basic database concepts.	x	x	x						
	Standard 7.10: *Demonstrate knowledge of knowledge-based (expert) systems.*									
IT.7.10.1	Demonstrate knowledge of problem analysis and diagnosis methods.	x	x	x			x			

IT.7.10.2	Apply task-level analysis and problem-solving methods to classification problems.	x	x	x	x	x	x	x	x	x
IT.7.10.3	Apply task-level analysis and problem-solving methods to configuration (design) problems.	x	x	x	x	x	x	x	x	x
IT.7.10.4	Identify methods for representing and reasoning with uncertain knowledge.	x	x	x						
IT.7.10.5	Demonstrate knowledge of inference-processing basic control strategies (e.g., depth-first, breadth-first).	x	x	x			x			
IT.7.10.6	Apply forward and backward reasoning to system development.	x	x	x			x			
IT.7.10.7	Demonstrate knowledge of heuristic search strategies.	x	x	x			x			
IT.7.10.8	Differentiate between expert systems and shells.	x	x	x			x			
IT.7.10.9	Demonstrate knowledge of task-level architectures.	x	x	x			x			
IT.7.10.10	Employ knowledge system development tools.	x	x	x			x			
	Standard 7.11: *Demonstrate basic knowledge of artificial intelligence (AI).*									
IT.7.11.1	Demonstrate knowledge of the history, scope and limits of AI, including Turing's test.	x	x	x				x	x	
IT.7.11.2	Demonstrate knowledge of AI terminology and concepts.	x	x	x				x	x	
IT.7.11.3	Demonstrate knowledge of the fundamentals of AI problem solving.	x	x	x				x	x	
IT.7.11.4	Demonstrate knowledge of the fundamentals of knowledge representation logic.	x	x	x				x	x	
IT.7.11.5	Demonstrate knowledge of knowledge-based systems involving natural language, speech, and vision.	x	x	x				x	x	
IT.7.11.6	Demonstrate knowledge of the terminology and concepts related to visual perception and computer vision.	x	x	x				x	x	
IT.7.11.7	Demonstrate knowledge of pattern recognition theory.	x	x	x				x	x	
IT.7.11.8	Demonstrate knowledge of machine learning theory.	x	x	x				x	x	
IT.7.11.9	Demonstrate knowledge of robotics.	x	x	x				x	x	
IT.7.11.10	Demonstrate knowledge of neural networks.	x	x	x				x	x	
IT.7.11.11	Demonstrate knowledge of rule-based systems and cognitive modeling.	x	x	x				x	x	
IT.7.11.12	Demonstrate knowledge of the computational techniques used in typical artificial intelligence subareas.	x	x	x				x	x	
IT.7.11.13	Demonstrate knowledge of the construction of intelligent machines.	x	x	x				x	x	
IT.7.11.14	Identify current research topics in artificial intelligence.	x	x	x				x	x	
	Standard 7.12: *Demonstrate basic knowledge of computational complexity (computability and unsolvability).*									
IT.7.12.1	Demonstrate knowledge of Turing machines and computability.	x	x	x				x	x	
IT.7.12.2	Demonstrate knowledge of Turing machine construction.	x	x	x				x	x	
IT.7.12.3	Demonstrate knowledge of Turing machine variants.	x	x	x				x	x	
IT.7.12.4	Demonstrate knowledge of the Church-Turing thesis and its implications.	x	x	x				x	x	
IT.7.12.5	Demonstrate knowledge of reductions between languages.	x	x	x				x	x	
IT.7.12.6	Demonstrate knowledge of decidability and Turing recognizability.	x	x	x				x	x	
IT.7.12.7	Demonstrate knowledge of the recursion theorem.	x	x	x				x	x	
IT.7.12.8	Demonstrate knowledge of time and space complexity measures.	x	x	x				x	x	
IT.7.12.9	Differentiate between nondeterministic and deterministic complexity.	x	x	x				x	x	
IT.7.12.10	Demonstrate knowledge of techniques for proving problems hard/complete.	x	x	x				x	x	
IT.7.12.11	Demonstrate knowledge of basic complexity classes (e.g., LOG, NLOG, P, NP, co-NP, PSPACE, EXP).	x	x	x				x	x	
IT.7.12.12	Demonstrate knowledge of randomized computation.	x	x	x				x	x	
IT.7.12.13	Demonstrate knowledge of public-key cryptosystems and cryptography.	x	x	x				x	x	
IT.7.12.14	Demonstrate knowledge of approximation algorithms.	x	x	x				x	x	
IT.7.12.15	Demonstrate knowledge of parallel complexity classes.	x	x	x				x	x	
	Standard 7.13: *Apply basic knowledge of parallel computing.*									
IT.7.13.1	Identify models of parallel computers.	x	x	x				x	x	
IT.7.13.2	Demonstrate knowledge of basic concepts of parallel computing (e.g., design, implementation, evaluation for shared-memory architectures, local-memory architectures, and vector processors).	x	x	x				x	x	
IT.7.13.3	Demonstrate knowledge of basic communication operations.	x	x	x				x	x	

IT.7.13.4	Demonstrate knowledge of parallel algorithm design and analysis.	x	x	x				x	x	
IT.7.13.5	Demonstrate knowledge of problem solving on parallel computers.	x	x	x				x	x	
IT.7.13.6	Demonstrate knowledge of performance and scalability of parallel systems.	x	x	x				x	x	
IT.7.13.7	Perform parallel programming.	x	x	x						
IT.7.13.8	Solve sparse systems of linear equations.	x	x	x			x			
IT.7.13.9	Demonstrate sorting ability.	x	x	x			x			
IT.7.13.10	Perform fast Fornier transforms.	x	x	x			x			
IT.7.13.11	Operate advanced parallel computers (e.g., Cray Y-MP, Cray T3D, IBM SP2 and Convex SPP 12200).	x	x	x			x			
	Software Systems Management									
	INSPIRE>EBSCO Host>Business Source									
	Standard 8.1: *Install* /configure software programs.									
IT.8.1.1	Identify hardware requirements (e.g., processor, memory, disk space, communications, printers, monitors).	x	x	x			x			
IT.8.1.2	Determine compatibility of hardware and software.	x	x	x						
IT.8.1.3	Install given application/system software on various platforms in accordance with manufacturer's procedures.	x	x	x	x	x	x	x	x	x
IT.8.1.4	Access needed help using manufacturers' technical help lines or Internet sites.	x	x	x	x	x	x	x	x	x
IT.8.1.5	Disable/uninstall software that may interfere with installation of new software.	x	x	x	x	x	x	x	x	x
IT.8.1.6	Verify conformance to licensing agreement.	x	x	x						
IT.8.1.7	Differentiate between procedures for an upgrade and for a new installation.	x	x	x						
IT.8.1.8	Differentiate between stand-alone and network installation procedures.	x	x	x						
IT.8.1.9	Select appropriate installation options (e.g., default, customized).	x	x	x						
IT.8.1.10	Configure software to appropriate operating system settings.	x	x	x			x			
IT.8.1.11	Troubleshoot unexpected results.	x	x	x	x	x	x	x	x	
IT.8.1.12	Formulate new installation procedure if needed.	x	x	x						
IT.8.1.13	Customize software to meet user preferences.	x	x	x	x	x	x	x	x	x
IT.8.1.14	Document step-by-step installation and configuration procedures.	x	x	x	x	x	x	x	x	x
IT.8.1.15	Verify software installation and operation.	x	x	x						
IT.8.1.16	Convert data files if required.	x	x	x			x	x		
IT.8.1.17	Configure macros, tools, and packages to accomplish simple organizational and personal tasks.	x	x	x	x	x	x	x	x	x
	Standard 8.2: *Perform configuration management activities.*									
IT.8.2.1	Demonstrate knowledge of identification and control functions.	x	x	x						
IT.8.2.2	Demonstrate knowledge of version management and interface control.	x	x	x						
IT.8.2.3	Select appropriate tools for configuration management.	x	x	x			x			
IT.8.2.4	Determine standards to be applied (e.g., international, industry, military).	x	x	x	x	x	x	x	x	x
IT.8.2.5	Specify baseline and software life-cycle phases.	x	x	x			x			
IT.8.2.6	Assess the impact of changes that affect interfaces.	x	x	x	x	x	x	x	x	x
	Standard 8.3: *Evaluate application software packages.*									
IT.8.3.1	Perform work flow analysis to determine user needs.	x	x	x	x	x	x	x	x	x
IT.8.3.2	Compare/contrast ease of learning, use, and interfacing for different software packages.	x	x	x	x	x	x	x	x	x
IT.8.3.3	Compare/contrast performance and features of different software packages (e.g., speed of retrieval, copying, saving, speller, thesaurus, moving, sorting).	x	x	x	x	x	x	x	x	x
IT.8.3.4	Compare/contrast ease of technical support for different software packages.	x	x	x	x	x	x	x	x	x
IT.8.3.5	Compare/contrast clarity of documentation for different software packages.	x	x	x	x	x	x	x	x	x
IT.8.3.6	Compare/contrast licensing agreements for different software packages.	x	x	x	x	x	x	x	x	x
IT.8.3.7	Document results of the software evaluation.	x	x	x	x	x	x	x	x	x
IT.8.3.8	Perform/document a software configuration audit.	x	x	x	x	x	x	x	x	x

IT.8.3.9	Perform/document a physical configuration audit.	x	x	x	x	x	x	x	x	x
IT.8.3.10	Evaluate appropriateness of software for specific projects.	x	x	x	x	x	x	x	x	x
IT.8.3.11	Prepare a cost-benefit analysis for a software package.	x	x	x	x	x	x	x	x	x
IT.8.3.12	Develop a method for evaluation.	x	x	x	x	x	x	x	x	x
IT.8.3.13	Test the functionality of proposed software configuration.	x	x	x	x	x	x	x	x	x
	Appreciation of the Arts									
	INSPIRE>Links>Arts & Music									
	Standard 9.1: *Demonstrate knowledge of and an appreciation for music.*									
IT.9.1.1	Compare/contrast the role of music in different historical periods.	x	x	x	x	x	x	x	x	x
IT.9.1.2	Assess the role of music in contemporary living.	x	x	x	x	x	x	x	x	x
IT.9.1.3	Compare/contrast the function of music in different cultures.	x	x	x	x	x	x	x	x	x
IT.9.1.4	Demonstrate knowledge of the basic physical properties of sound (e.g., pitch, intensity, duration, and timbre).	x	x	x	x	x	x	x	x	x
IT.9.1.5	Demonstrate knowledge of the various elements of music (e.g., rhythm, melody, harmony, tone, color, and form).	x	x	x	x	x	x	x	x	x
IT.9.1.6	Demonstrate knowledge of how musical elements relate to the meaning or content of a composition.	x	x	x	x	x	x	x	x	x
IT.9.1.7	Identify the feelings conveyed by various musical elements (e.g., thematic construction, tonal color, instruments, texture, volume, and tempo).	x	x	x	x	x	x	x	x	x
	Standard 9.2: *Demonstrate knowledge of and an appreciation for the visual and performing arts.*									
IT.9.2.1	Compare/contrast the visual and performing art styles of various historical periods.	x	x	x	x	x	x	x	x	x
IT.9.2.2	Define various forms of visual and performing art.	x	x	x	x	x	x	x	x	x
IT.9.2.3	Demonstrate knowledge of the various elements of visual arts (e.g., lines, colors, light and dark, texture, volume, perspective) and performing arts.	x	x	x	x	x	x	x	x	x
IT.9.2.4	Identify the feelings conveyed by various elements of visual and performing arts.	x	x	x	x	x	x	x	x	x
	Standard 9.3: *Make use of the interaction between music and visual art.*									
IT.9.3.1	Identify uses of music visualization.	x	x	x	x	x	x	x	x	x
IT.9.3.2	Combine selected music and visuals to evoke a specific emotional response.	x	x	x	x	x	x	x	x	x
	Standard 9.4: *Demonstrate knowledge of and an appreciation for literature* .									
IT.9.4.1	Compare/contrast the role of literature in different historical periods.	x	x	x	x	x	x	x	x	x
IT.9.4.2	Assess the role of literature in contemporary living.	x	x	x	x	x	x	x	x	x
IT.9.4.3	Compare/contrast the function of literature in different cultures.	x	x	x	x	x	x	x	x	x
IT.9.4.4	Analyze the impact of literature on the business environment.	x	x	x	x	x	x	x	x	x
IT.9.4.5	Demonstrate knowledge of the basic themes used in literature.	x	x	x	x	x	x	x	x	x
IT.9.4.6	Demonstrate knowledge of the basic styles/genres of literature.	x	x	x	x	x	x	x	x	x
IT.9.4.7	Identify the basic elements of a story (e.g., plot, characters, and setting).	x	x	x	x	x	x	x	x	x
IT.9.4.8	Analyze the themes and styles used in interactive stories.	x	x	x	x	x	x	x	x	x
	Graphic Design Fundamentals									
	INSPIRE>Links>Reference>Art,Music,Dance & Fine Arts Sites									
	Standard 10.1: *Demonstrate basic technical art skills (traditional and electronic).*									
IT.10.1.1	Make computations for centering, spacing, and scaling drawings.	x	x	x						
IT.10.1.2	Employ various types of drawing media and a variety of surfaces.	x	x	x						
IT.10.1.3	Employ various mechanical drawing equipment.	x	x	x						
IT.10.1.4	Interpret information from drawings, prints, and sketches.	x	x	x	x	x	x	x	x	x
IT.10.1.5	Draw freehand sketches.	x	x	x	x	x	x	x	x	x
IT.10.1.6	Draw auxiliary views.	x	x	x	x	x	x	x	x	x
IT.10.1.7	Draw one- and two-point perspectives.	x	x	x	x	x	x	x	x	x
IT.10.1.8	Alter drawings.	x	x	x						

IT.10.1.9	Create charts, graphs, and diagrams.	x	x	x	x	x	x	x	x	x
IT.10.1.10	Evaluate drawings.	x	x	x						
IT.10.1.11	Make collages.	x	x	x	x	x	x	x	x	x
	Standard 10.2: *Demonstrate knowledge of design principles.*									
IT.10.2.1	Demonstrate knowledge of the two-dimensional picture plan.	x	x	x						
IT.10.2.2	Demonstrate knowledge of the principles and elements of design and their relationship to each other.	x	x	x						
IT.10.2.3	Demonstrate knowledge of the nature of color and color harmonies.	x	x	x						
IT.10.2.4	Assess the impact of various color harmonies on a two-dimensional picture plan.	x	x	x						
IT.10.2.5	Assess how color affects the principles of line, value, shape and form.	x	x	x						
	Standard 10.3: *Demonstrate design skills.*									
IT.10.3.1	Apply elements of design (e.g., line, shape, color).	x	x	x	x	x	x	x	x	x
IT.10.3.2	Apply principles of design (e.g., proportion, balance, harmony, rhythm, unity).	x	x	x	x	x	x	x	x	x
IT.10.3.3	Apply color theory.	x	x	x	x	x	x	x	x	x
IT.10.3.4	Use tones, hues, and values.	x	x	x	x	x	x	x	x	x
IT.10.3.5	Develop thumbnail concepts.	x	x	x	x	x	x	x	x	x
IT.10.3.6	Develop rough and comprehensive layouts.	x	x	x	x	x	x	x	x	x
IT.10.3.7	Paint freehand or within sketched designs using mixed colors.	x	x	x	x	x	x	x	x	x
IT.10.3.8	Apply color for impact.	x	x	x	x	x	x	x	x	x
IT.10.3.9	Determine appropriate uses of halftone, duotone, and multi-color processes.	x	x	x	x	x	x	x	x	x
IT.10.3.10	Create symmetric and asymmetric designs.	x	x	x	x	x	x	x	x	x
IT.10.3.11	Create various mock-ups and dummies.	x	x	x	x	x	x	x	x	x
IT.10.3.12	Select appropriate style for desired impact.	x	x	x	x	x	x	x	x	x
IT.10.3.13	Make collages.	x	x	x	x	x	x	x	x	x
	Standard 10.4: *Demonstrate knowledge of available graphics software programs.*									
IT.10.4.1	Compare/contrast different types of graphics software.	x	x	x						
IT.10.4.2	Demonstrate knowledge of graphic tools, menus, and functions, such as grouping, transformations and blending.	x	x	x						
IT.10.4.3	Demonstrate knowledge of simple and advanced development tools, styles, templates, and wizards.	x	x	x						
IT.10.4.4	Demonstrate knowledge of simple and advanced techniques for manipulating object attributes and types.	x	x	x						
IT.10.4.5	Select the most effective graphics software for the intended uses.	x	x	x						
	Standard 10.5: *Create computer graphics.*									
IT.10.5.1	Identify types of graphics.	x	x	x						
IT.10.5.2	Define audience and purpose of graphics.	x	x	x						
IT.10.5.3	Select the appropriate style of graphics based on the intended purpose.	x	x	x						
IT.10.5.4	Create graphics that integrate principles of communication and elements of visual design.	x	x	x	x	x	x	x	x	x
IT.10.5.5	Manipulate color, shape, size, and textures of graphics.	x	x	x						
IT.10.5.6	Import objects from other applications.	x	x	x						
IT.10.5.7	Export objects to other applications.	x	x	x						
IT.10.5.8	Rotate graphics.	x	x	x						
IT.10.5.9	Rotate text.	x	x	x						
IT.10.5.10	Paint/touch up images.	x	x	x						
IT.10.5.11	Add/subtract image parts.	x	x	x						
IT.10.5.12	Apply 2-D and 3-D graphics principles.	x	x	x						
IT.10.5.13	Manipulate multiple image layers.	x	x	x						
IT.10.5.14	Employ masking techniques.	x	x	x						
IT.10.5.15	Crop images.	x	x	x						

IT.10.5.16	Scale images.	x	x	x						
IT.10.5.17	Employ various filtration methods.	x	x	x						
IT.10.5.18	Convert vector to raster images.	x	x	x						
IT.10.5.19	Store images in appropriate formats and resolutions for specific applications.	x	x	x						
IT.10.5.20	Save/retrieve graphics.	x	x	x						
IT.10.5.21	Print graphics to various output devices.	x	x	x						
IT.10.5.22	Demonstrate knowledge of resolution issues.	x	x	x						
	Standard 10.6: *Apply knowledge of typography.*									
IT.10.6.1	Demonstrate knowledge of typography materials.	x	x	x						
IT.10.6.2	Interpret typographic terms.	x	x	x						
IT.10.6.3	Demonstrate knowledge of typographic methods.	x	x	x						
IT.10.6.4	Demonstrate knowledge of proofreaders' marks.	x	x	x						
IT.10.6.5	Demonstrate knowledge of picas, points, and their conversion to inches.	x	x	x						
IT.10.6.6	Demonstrate knowledge of specification of type and copy fitting.	x	x	x						
IT.10.6.7	Identify typographic styles.	x	x	x						
IT.10.6.8	Define basic letter structures.	x	x	x						
IT.10.6.9	Mix families of type within a project and within certain parameters.	x	x	x	x	x	x	x	x	x
IT.10.6.10	Interpret typographical specifications.	x	x	x						
IT.10.6.11	Select proper letter and line spacing.	x	x	x						
IT.10.6.12	Select appropriate typefaces.	x	x	x						
IT.10.6.13	Prepare type formats (e.g., style sheets).	x	x	x	x	x	x	x	x	
IT.10.6.14	Create templates.	x	x	x	x	x	x	x	x	
	Photography									
	INSPIRE>Links>Reference>Art & Music									
	Standard 11.1: *Operate photographic equipment.*									
IT.11.1.1	Differentiate between various camera formats (i.e., traditional vs. digital).	x	x	x						
IT.11.1.2	Select appropriate camera format for given situation.	x	x	x			x			
IT.11.1.3	Demonstrate knowledge of apertures.	x	x	x						
IT.11.1.4	Identify the optimum aperture of a lens.	x	x	x						
IT.11.1.5	Demonstrate knowledge of shutter speeds.	x	x	x						
IT.11.1.6	Identify the optimum shutter speed for desired exposure effects.	x	x	x			x			
IT.11.1.7	Use shutter speed to stop and show motion.	x	x	x						
IT.11.1.8	Demonstrate knowledge of film speed sequencing.	x	x	x						
IT.11.1.9	Identify the optimum film speed for desired sensitivity.	x	x	x			x			
IT.11.1.10	Calculate equivalent exposures.	x	x	x			x			
IT.11.1.11	Identify desired exposure using a hand held meter.	x	x	x			x			
IT.11.1.12	Correct distortion using camera movements.	x	x	x						
IT.11.1.13	Identify light sources.	x	x	x						
IT.11.1.14	Provide needed lighting conditions using hand held electronic flash units.	x	x	x			x			
IT.11.1.15	Create photographs using varied films, lighting, and formats.	x	x	x	x	x	x	x	x	x
IT.11.1.16	Create photographs using different lenses (e.g., wide-angle, telephoto, zoom).	x	x	x	x	x	x	x	x	x
IT.11.1.17	Create photographs using various lens filters (e.g., light-balancing, color-compensating, polarizing, special effects, black-and-white contrast control).	x	x	x	x	x	x	x	x	x

	Standard 11.2: *Demonstrate knowledge of photographic language.*									
IT.11.2.1	Demonstrate knowledge of the role played by the following photographic elements: composition, formal qualities, scale, use of space, use of light.	x	x	x						
IT.11.2.2	Demonstrate knowledge of how the meaning of a photograph is affected by composition, formal qualities, scale, use of space, and use of light.	x	x	x						
IT.11.2.3	Identify the use and meaning of symbolism in given photographs.	x	x	x						
IT.11.2.4	Identify the use and meaning of metaphor in given photographs.	x	x	x						
	Digital Media Design									
	INSPIRE>EBSCO Host>MasterFILE									
	Standard 12.1: *Create visual design guidelines.*									
IT.12.1.1	Integrate paint illustration program techniques with digital photography imagery.	x	x	x	x	x	x	x	x	x
IT.12.1.2	Consider the visual characteristics of various mediums.	x	x	x						
IT.12.1.3	Assess how the technical limitations of the medium affect content and style.	x	x	x						
IT.12.1.4	Consider the relationship between form and content.	x	x	x						
IT.12.1.5	Plan a visual design in which form follows function.	x	x	x	x	x	x	x	x	x
IT.12.1.6	Create the look and feel of the product.	x	x	x	x	x	x	x	x	x
IT.12.1.7	Combine software utilities in screening for translucency and for layering of multiple images.	x	x	x						
IT.12.1.8	Select appropriate colors.	x	x	x						
IT.12.1.9	Define color editing capabilities.	x	x	x						
IT.12.1.10	Complete basic design.	x	x	x	x	x	x	x	x	x
IT.12.1.11	Represent/simplify 3-D shapes and textures.	x	x	x						
IT.12.1.12	Integrate human factors and user interface in visual design.	x	x	x	x	x	x	x	x	x
IT.12.1.13	Evaluate visual appeal of design.	x	x	x						
IT.12.1.14	Produce simulations.	x	x	x	x	x	x	x	x	x
IT.12.1.15	Evaluate simulations.	x	x	x	x	x	x	x	x	x
	Standard 12.2: *Apply functional design of digital media to technical presentations.*									
IT.12.2.1	Design computer model objects for function.	x	x	x	x	x	x	x	x	x
IT.12.2.2	Deduce design by examination of digital product function.	x	x	x						
IT.12.2.3	Prepare functional requirements/specifications.	x	x	x			x			
IT.12.2.4	Select appropriate media types.	x	x	x			x			
IT.12.2.5	Select delivery applications/platforms.	x	x	x			x			
IT.12.2.6	Design necessary system architecture.	x	x	x	x	x	x	x	x	x
IT.12.2.7	Design user interface.	x	x	x	x	x	x	x	x	x
IT.12.2.8	Design navigation schema.	x	x	x	x	x	x	x	x	x
IT.12.2.9	Create storyboard(s).	x	x	x	x	x	x	x	x	x
IT.12.2.10	Create/refine design concepts.	x	x	x	x	x	x	x	x	x
IT.12.2.11	Participate in interactive development with clients and development team members.	x	x	x	x	x	x	x	x	x
IT.12.2.12	Prepare technical presentation as a member of a development team.	x	x	x	x	x	x	x	x	x
	Standard 12.3: *Demonstrate proficiency in the use of digital imaging techniques and equipment.*									
IT.12.3.1	Demonstrate knowledge of standard hardware platform components and configurations (e.g., UNIX, IBM, Macintosh).	x	x	x						
IT.12.3.2	Identify memory and storage requirements.	x	x	x						
IT.12.3.3	Identify computer architecture requirements for digital imaging.	x	x	x						
IT.12.3.4	Demonstrate knowledge of parallel/serial transmission.	x	x	x						
IT.12.3.5	Demonstrate knowledge of how a digital image is generated.	x	x	x						
IT.12.3.6	Identify types of digital imaging software.	x	x	x						

IT.12.3.7	Demonstrate knowledge of the characteristics and operation of digital imaging equipment (e.g., scanner, digital camera, video input devices, graphics tablet, graphics expansion board, printer, film recorder, and output devices); identify types of digital imaging software.	x	x	x						
IT.12.3.8	Compare performance of different types of image acquisition hardware.	x	x	x						
IT.12.3.9	Compare/contrast area and linear arrays.	x	x	x						
IT.12.3.10	Compare/contrast exposure and multiexposure systems.	x	x	x						
IT.12.3.11	Demonstrate knowledge of resolution issues.	x	x	x						
IT.12.3.12	Perform resolution calculations (e.g., number of pixels, number of colors).	x	x	x			x			
IT.12.3.13	Compare/contrast addressable and displayable resolution.	x	x	x						
IT.12.3.14	Access information needed to operate a given digital camera system using standard print and electronic help tools.	x	x	x	x	x	x	x	x	x
IT.12.3.15	Capture images with digital camera.	x	x	x						
IT.12.3.16	Demonstrate knowledge of archiving and managing images.	x	x	x						
	Standard 12.4: *Manipulate images.*									
IT.12.4.1	Identify image file formats.	x	x	x						
IT.12.4.2	Manipulate levels.	x	x	x						
IT.12.4.3	Convert file formats.	x	x	x						
IT.12.4.4	Manipulate curves.	x	x	x						
IT.12.4.5	Manipulate contrast.	x	x	x						
IT.12.4.6	Crop images.	x	x	x						
IT.12.4.7	Scale images.	x	x	x						
IT.12.4.8	Adjust images using various filtration methods.	x	x	x						
IT.12.4.9	Adjust images using selection tools.	x	x	x						
IT.12.4.10	Adjust images using painting and editing tools.	x	x	x						
IT.12.4.11	Manipulate multiple image layers.	x	x	x						
IT.12.4.12	Adjust images using masking techniques.	x	x	x						
IT.12.4.13	Optimize images for specific uses.	x	x	x						
	Standard 12.5: *Demonstrate knowledge of the basic principles of 3-D modeling.*									
IT.12.5.1	Demonstrate knowledge of how to convert objects from two-dimensional to three-dimensional.	x	x	x			x			
IT.12.5.2	Demonstrate knowledge of how a computer deals with geometry.	x	x	x			x			
IT.12.5.3	Identify the software available for 3-D modeling.	x	x	x						
IT.12.5.4	Demonstrate knowledge of the steps for building a 3-D model.	x	x	x						
IT.12.5.5	Demonstrate knowledge of the components of a wireframe model.	x	x	x						
	Standard 12.6: *Create 3-D models.*									
IT.12.6.1	Create a model using 3-D modeling software.	x	x	x	x	x	x	x	x	x
IT.12.6.2	Determine desired camera angle.	x	x	x			x			
IT.12.6.3	Adjust lighting angle, focus, and color to achieve desired effect.	x	x	x			x			
IT.12.6.4	Adjust surface color, texture, transparency, and reflectivity to achieve desired effect.	x	x	x			x			
IT.12.6.5	Compare/contrast flat shading, curved shading, and ray tracing.	x	x	x						
IT.12.6.6	Render the object using flat shading.	x	x	x						
IT.12.6.7	Render the object using curved shading.	x	x	x						
IT.12.6.8	Render the object using ray tracing.	x	x	x						
IT.12.6.9	Combine models to create a scene.	x	x	x						
IT.12.6.10	Render the completed scene.	x	x	x			x			
	Standard 12.7: *Perform advanced 3-D image generation techniques.*									
IT.12.7.1	Follow basic animation principles.	x	x	x						

IT.12.7.2	Perform basic texture-mapping algorithms.	x	x	x						
IT.12.7.3	Perform basic antialiasing.	x	x	x						
IT.12.7.4	Apply ray tracing and radiosity methods.	x	x	x						
IT.12.7.5	Perform basic volume-rendering algorithms.	x	x	x						
IT.12.7.6	Perform surface detail modeling.	x	x	x						
IT.12.7.7	Develop basic curves and surfaces.	x	x	x						
	Standard 12.8: Demonstrate knowledge of the basic principles of animation.									
IT.12.8.1	Identify knowledge of history of animation.	x	x	x						
IT.12.8.2	Demonstrate knowledge of the principles of continuity, key frames, motion paths, and motion.	x	x	x						
IT.12.8.3	Demonstrate knowledge of the uses of special effects and virtual navigation.	x	x	x						
IT.12.8.4	Identify available animation software programs/tools.	x	x	x						
IT.12.8.5	Demonstrate knowledge of 2-D sprite animation.	x	x	x						
IT.12.8.6	Demonstrate knowledge of the principles of cell animation.	x	x	x						
IT.12.8.7	Demonstrate knowledge of prerendered 3-D animation.	x	x	x						
IT.12.8.8	Demonstrate knowledge of real-time 3-D animation.	x	x	x						
	Standard 12.9: *Animate characters.*									
IT.12.9.1	Demonstrate knowledge of how to design a character based on a narrative context.	x	x	x						
IT.12.9.2	Demonstrate knowledge of how to animate a character so as to express its nature.	x	x	x						
IT.12.9.3	Demonstrate knowledge of how to capture motion.	x	x	x						
IT.12.9.4	Design 2-D characters.	x	x	x	x	x	x	x	x	x
IT.12.9.5	Design 3-D models of characters.	x	x	x	x	x	x	x	x	x
IT.12.9.6	Develop characters in accordance with designs.	x	x	x	x	x	x	x	x	x
	Standard 12.10: *Create 3-D environments.*									
IT.12.10.1	Create buildings and rooms.	x	x	x	x	x	x	x	x	x
IT.12.10.2	Import buildings and rooms.	x	x	x						
IT.12.10.3	Create land forms.	x	x	x	x	x	x	x	x	x
IT.12.10.4	Import land forms.	x	x	x						
IT.12.10.5	Create bodies of water (e.g., lakes, rivers, oceans, waterfalls).	x	x	x	x	x	x	x	x	x
IT.12.10.6	Create basic water textures, reflections, refractions, and splashing.	x	x	x	x	x	x	x	x	x
IT.12.10.7	Incorporate fog and background images.	x	x	x						
IT.12.10.8	Manipulate particle systems such as rain and snow.	x	x	x						
IT.12.10.9	Apply lighting effects.	x	x	x						
IT.12.10.10	Add special effects.	x	x	x						
	Standard 12.11: *Demonstrate knowledge of virtual reality.*									
IT.12.11.1	Demonstrate knowledge of the basic principles of virtual reality.	x	x	x						
IT.12.11.2	Demonstrate knowledge of the principles of geometry relative to virtual reality.	x	x	x						
IT.12.11.3	Demonstrate knowledge of virtual reality file formats (e.g., 9SVR, VRML).	x	x	x						
IT.12.11.4	Manage polygon resources.	x	x	x						
IT.12.11.5	Create a basic virtual world.	x	x	x	x	x	x	x	x	x
IT.12.11.6	Code object intelligence into a virtual world.	x	x	x	x	x	x	x	x	x
	Video/Film Production.									
	INSPIRE>EBSCO Host>Academic Search									
	Standard 13.1: *Interpret the relationship between the creative and craft skills required for film/video production.*									
IT.13.1.1	Identify the working relationships that exist between the various participants involved in the video/film/theatrical-production process.	x	x	x						

IT.13.1.2	Demonstrate knowledge of the specific technical processes used by the camera, grip, lighting, sound, art, costume, special effects, make up, and editing departments.	x	x	x						
IT.13.1.3	Analyze a script and storyboard to identify technical requirements.	x	x	x	x	x	x	x	x	x
IT.13.1.4	Compare/contrast the techniques used in video/film/theatrical production in studio and field.	x	x	x			x			
	Standard 13.2: *Perform technical support tasks for a video production.*									
IT.13.2.1	Formulate strategies to properly utilize equipment during film/video production.	x	x	x	x	x	x	x	x	x
IT.13.2.2	Originate solutions to unique shooting problems.	x	x	x	x	x	x	x	x	x
IT.13.2.3	Organize pre- and post-production routines.	x	x	x	x	x	x	x	x	x
IT.13.2.4	Analyze production requirements to determine equipment needs.	x	x	x	x	x	x	x	x	x
IT.13.2.5	Create required effects for lighting set-ups.	x	x	x	x	x	x	x	x	x
IT.13.2.6	Demonstrate safe work habits.	x	x	x			x			
IT.13.2.7	Work as a member of a film production team.	x	x	x	x	x	x	x	x	x
	Standard 13.3: *Perform camera-related tasks for a video production.*									
IT.13.3.1	Analyze the aesthetic needs of a shot and accomplish them.	x	x	x	x	x	x	x	x	x
IT.13.3.2	Organize the proper care and handling of camera and camera assist equipment.	x	x	x	x	x	x	x	x	x
IT.13.3.3	Analyze the script for camera lens and shot requirements.	x	x	x	x	x	x	x	x	x
IT.13.3.4	Organize pre- and post-production routines for camera operation.	x	x	x	x	x	x	x	x	x
IT.13.3.5	Analyze production requirements to determine camera equipment needs.	x	x	x	x	x	x	x	x	x
	Standard 13.4: *Perform lighting activities for a video/theatrical production.*									
IT.13.4.1	Demonstrate knowledge of different types of lighting fixtures.	x	x	x	x	x	x	x	x	x
IT.13.4.2	Identify parts of lighting fixtures and the function of each.	x	x	x						
IT.13.4.3	Identify various applications of stage lighting equipment.	x	x	x						
IT.13.4.4	Demonstrate knowledge of functions of master lighting panel and dimmer board.	x	x	x	x	x	x	x	x	x
IT.13.4.5	Analyze/document lighting requirements for production.	x	x	x	x	x	x	x	x	x
IT.13.4.6	Design a standard lighting plot.	x	x	x	x	x	x	x	x	x
IT.13.4.7	Set up appropriate lighting for a production.	x	x	x	x	x	x	x	x	x
IT.13.4.8	Operate master lighting panel and dimmer board in accordance with specifications.	x	x	x	x	x	x	x	x	x
IT.13.4.9	Appraise maintenance needs for lighting equipment.	x	x	x	x	x	x	x	x	x
IT.13.4.10	Design special effects lighting.	x	x	x	x	x	x	x	x	x
	Standard 13.5: *Design scenery for a video/theatrical production.*									
IT.13.5.1	Design scenic plans to scale.	x	x	x	x	x	x	x	x	x
IT.13.5.2	Interpret scenic plans to determine the materials and hardware needed for scenic construction.	x	x	x	x	x	x	x	x	x
IT.13.5.3	Formulate design strategies for the construction of scenery.	x	x	x	x	x	x	x	x	x
IT.13.5.4	Create special effects scenery.	x	x	x	x	x	x	x	x	x
IT.13.5.5	Select stage props.	x	x	x	x	x	x	x	x	x
IT.13.5.6	Organize transportation of scenery to remote locations.	x	x	x	x	x	x	x	x	x
IT.13.5.7	Inspect/repair scenery as needed.	x	x	x	x	x	x	x	x	x
	Standard 13.6: *Operate video cameras.*									
IT.13.6.1	Record under tungsten conditions.	x	x	x						
IT.13.6.2	Record under daylight conditions.	x	x	x						
IT.13.6.3	Record under backlight conditions.	x	x	x						
IT.13.6.4	Record while panning.	x	x	x						
IT.13.6.5	Record while zooming.	x	x	x						
IT.13.6.6	Record while tilting.	x	x	x						
IT.13.6.7	Record while simultaneously panning, tilting, and zooming with camera mounted on a tripod.	x	x	x						

IT.13.6.8	Record while simultaneously panning, tilting, and zooming using a hand-held camera.	x	x	x							
IT.13.6.9	Play back recording on monitor.	x	x	x							
IT.13.6.10	Identify the effect on a video camera of changing the setting in low light levels.	x	x	x							
	Standard 13.7: *Identify video formats.*										
IT.13.7.1	Compare/contrast consumer-, industrial-, and broadcast-grade video cameras.	x	x	x							
IT.13.7.2	Demonstrate knowledge of the characteristics of various camera formats (e.g., Betacam, VHS, 8mm, super VHS, and DV-Cam).	x	x	x			x				
IT.13.7.3	Identify image characteristics affected by camera choice.	x	x	x							
IT.13.7.4	Compare/contrast frame and field modes.	x	x	x			x				
IT.13.7.5	Compare/contrast NTSC, PAL, and RGB video signals.	x	x	x			x				
IT.13.7.6	Demonstrate knowledge of frame synchronization and time base correction.	x	x	x			x				
	Standard 13.8: *Perform editing operations.*										
IT.13.8.1	Demonstrate knowledge of operational parts of a videocassette editor.	x	x	x							
IT.13.8.2	Compare/contrast linear and nonlinear editing systems.	x	x	x			x				
IT.13.8.3	Set up videocassette editor.	x	x	x							
IT.13.8.4	Perform assemble edits.	x	x	x			x				
IT.13.8.5	Perform insert edits.	x	x	x			x				
IT.13.8.6	Edit using dissolves (A-B roll).	x	x	x			x				
IT.13.8.7	Add sound track.	x	x	x			x				
IT.13.8.8	Add narration/voice-over.	x	x	x			x				
IT.13.8.9	Interpret edit decision lists.	x	x	x			x				
IT.13.8.10	Employ edit decision lists.	x	x	x			x				
	Standard 13.9: *Digitize video.*										
IT.13.9.1	Demonstrate knowledge of the characteristics and uses of digitized video.	x	x	x							
IT.13.9.2	Demonstrate knowledge of digital video bandwidths and their implications.	x	x	x							
IT.13.9.3	Digitize videotapes using a video capture card and appropriate software.	x	x	x	x	x	x	x	x	x	
IT.13.9.4	Edit digitized video, including transitions, special effects, and computerized backgrounds.	x	x	x	x	x	x	x	x	x	
IT.13.9.5	Compress video files.	x	x	x							
IT.13.9.6	Employ the batch capture process.	x	x	x							
	Audio Production										
	INSPIRE>EBSCO Host>Academic Search										
	Standard 14.1: *Demonstrate knowledge of audio recording and sound reinforcement.*										
IT.14.1.1	Demonstrate knowledge of basic acoustic principles and formulae.	x	x	x							
IT.14.1.2	Demonstrate knowledge of the function and design of microphones.	x	x	x							
IT.14.1.3	Diagram signal flow throughout the recording chain.	x	x	x							
IT.14.1.4	Demonstrate knowledge of how to operate a mixing console, including its input and output functions.	x	x	x							
IT.14.1.5	Demonstrate knowledge of how to edit audio recordings.	x	x	x							
IT.14.1.6	Demonstrate knowledge of properties of analog and digital recording.	x	x	x							
IT.14.1.7	Demonstrate knowledge of sound reinforcement techniques used for live programs.	x	x	x							
IT.14.1.8	Demonstrate knowledge of the characteristics and applications of analog signal processing.	x	x	x							
IT.14.1.9	Demonstrate knowledge of the characteristics and applications of digital signal processing.	x	x	x							
IT.14.1.10	Critique recordings.	x	x	x	x	x	x	x	x	x	
	Standard 14.2: *Demonstrate knowledge of audio production.*										
IT.14.2.1	Analyze current trends in electronic music.	x	x	x	x	x	x	x	x	x	
IT.14.2.2	Demonstrate knowledge of MIDI.	x	x	x							

IT.14.2.3	Demonstrate knowledge of digital synthesis.	x	x	x							
IT.14.2.4	Demonstrate knowledge of how to select computer music appropriate for a given application.	x	x	x							
IT.14.2.5	Demonstrate knowledge of methods for compressing sound files.	x	x	x							
IT.14.2.6	Demonstrate knowledge of digital sampling.	x	x	x							
IT.14.2.7	Assess potential markets for electronic music.	x	x	x	x	x	x	x	x	x	
IT.14.2.8	Demonstrate knowledge of methods of analog and digital editing.	x	x	x							
IT.14.2.9	Demonstrate knowledge of how to use audio editors.	x	x	x							
IT.14.2.10	Demonstrate knowledge of digital audio bandwidths and their implications.	x	x	x							
IT.14.2.11	Demonstrate knowledge of the various computer hardware and software used in studio recording.	x	x	x							
IT.14.2.12	Demonstrate knowledge of methods for mastering audio recordings (e.g., in the form of an audiotape, compact disk, DVD).	x	x	x							
IT.14.2.13	Identify future technologies predicted for audio recording.	x	x	x	x	x	x	x	x	x	
	Standard 14.3: *Create a sound track.*										
IT.14.3.1	Evaluate performance needs.	x	x	x							
IT.14.3.2	Evaluate technical resources.	x	x	x							
IT.14.3.3	Analyze script information to identify sound requirements.	x	x	x	x	x	x	x	x	x	
IT.14.3.4	Design sound score appropriate to production and post-production needs.	x	x	x	x	x	x	x	x	x	
IT.14.3.5	Select sound material.	x	x	x	x	x	x	x	x	x	
IT.14.3.6	Select talent, if necessary.	x	x	x	x	x	x	x	x	x	
IT.14.3.7	Coordinate the work of the talent.	x	x	x	x	x	x	x	x	x	
IT.14.3.8	Determine microphone and speaker placement.	x	x	x							
IT.14.3.9	Incorporate mechanical and electrical sound effects.	x	x	x	x	x	x	x	x	x	
IT.14.3.10	Demonstrate knowledge of audio-for-video recording devices (analog, digital).	x	x	x							
IT.14.3.11	Set up audio-for-video recording devices.	x	x	x	x	x	x	x	x	x	
IT.14.3.12	Operate audio-for-video recording devices.	x	x	x							
IT.14.3.13	Demonstrate knowledge of the time-code system for audio-video synchronization.	x	x	x							
IT.14.3.14	Set up time-code system for audio-video synchronization.	x	x	x							
IT.14.3.15	Operate time-code system for audio-video synchronization.	x	x	x	x	x	x	x	x	x	
IT.14.3.16	Demonstrate knowledge of the parts of an audio mixing console.	x	x	x							
IT.14.3.17	Operate audio mixing console.	x	x	x	x	x	x	x	x	x	
IT.14.3.18	Create a MIDI sound score.	x	x	x	x	x	x	x	x	x	
	Internet										
	INSPIRE>Links>Reference>Webopedia Encyclopedia										
	Standard 15.1: *Demonstrate basic knowledge of the Internet.*										
IT.15.1.1	Identify the key characteristics of the Internet.	x	x	x							
IT.15.1.2	Demonstrate knowledge of the ownership/administration of the Internet.	x	x	x							
IT.15.1.3	Trace the development of Internet technology.	x	x	x	x	x	x	x	x	x	
IT.15.1.4	Identify current issues related to the Internet.	x	x	x	x	x	x	x	x	x	
IT.15.1.5	Identify services and tools offered on the Internet.	x	x	x	x	x	x	x	x	x	
IT.15.1.6	Identify the specific strengths, weaknesses, and special features of available search engines.	x	x	x	x	x	x	x	x	x	
IT.15.1.7	Demonstrate knowledge of bookmarks and their functions.	x	x	x							
IT.15.1.8	Demonstrate knowledge of accepted Internet etiquette (netiquette).	x	x	x	x	x	x	x	x	x	
IT.15.1.9	Identify current uses and applications of the Internet.	x	x	x	x	x	x	x	x	x	
	Standard 15.2: *Demonstrate advanced knowledge of the Internet.*										
IT.15.2.1	Demonstrate knowledge of the Transmission Control Protocol/Internet Protocol (TCP/IP) suite.	x	x	x							

IT.15.2.2	Demonstrate knowledge of the Domain Name Server (DNS).	x	x	x						
IT.15.2.3	Demonstrate knowledge of Simple Network Management Protocol (SNMP).	x	x	x						
IT.15.2.4	Demonstrate knowledge of Bootstrap Protocol (BOOTP) and Dynamic Host Configuration Protocol (DHCP).	x	x	x						
IT.15.2.5	Demonstrate knowledge of the Address Resolution Protocol (ARP).	x	x	x						
IT.15.2.6	Demonstrate knowledge of IP forwarding, encapsulation, and fragmentation.	x	x	x						
IT.15.2.7	Demonstrate knowledge of Internet security issues.	x	x	x	x	x	x	x	x	x
IT.15.2.8	Identify available Internet security systems.	x	x	x	x	x	x	x	x	x
	Standard 15.3: *Access the Internet.*									
IT.15.3.1	Connect to the Internet.	x	x	x						
IT.15.3.2	Test Internet connection.	x	x	x	x	x	x	x	x	x
IT.15.3.3	Demonstrate knowledge of the components of Internet software.	x	x	x						
IT.15.3.4	Install Internet software.	x	x	x						
IT.15.3.5	Explore browser features.	x	x	x						
IT.15.3.6	Download free software upgrades and shareware from the Internet.	x	x	x	x	x	x	x	x	x
IT.15.3.7	Unpack files using compression software.	x	x	x						
IT.15.3.8	Demonstrate acute awareness of virus protection techniques.	x	x	x	x	x	x	x	x	x
	Standard 15.4: *Utilize Internet services.*									
IT.15.4.1	Access business and technical information using the Internet.	x	x	x	x	x	x	x	x	x
IT.15.4.2	Select search engine(s) to use.	x	x	x	x	x	x	x	x	x
IT.15.4.3	Select appropriate search procedures and approaches.	x	x	x						
IT.15.4.4	Locate information using search engine(s) and Boolean logic.	x	x	x	x	x	x	x	x	x
IT.15.4.5	Navigate web sites using software functions (e.g., Forward, Back, Go To, Bookmarks).	x	x	x	x	x	x	x	x	x
IT.15.4.6	Evaluate Internet resources (e.g., accuracy of information).	x	x	x	x	x	x	x	x	x
IT.15.4.7	Access library catalogs on the Internet.	x	x	x	x	x	x	x	x	x
IT.15.4.8	Access commercial, government, and education resources.	x	x	x	x	x	x	x	x	x
IT.15.4.9	Bookmark web addresses (URLs).	x	x	x	x	x	x	x	x	x
IT.15.4.10	Download files from FTP archives.	x	x	x	x	x	x	x	x	x
IT.15.4.11	Communicate via e-mail using the Internet.	x	x	x	x	x	x	x	x	x
IT.15.4.12	Subscribe to mailing lists.	x	x	x	x	x	x	x	x	x
IT.15.4.13	Participate in newsgroups.	x	x	x	x	x	x	x	x	x
IT.15.4.14	Retrieve online tools.	x	x	x						
IT.15.4.15	Download/convert Internet programming files.	x	x	x	x	x	x	x	x	x
IT.15.4.16	Install/configure web browser.	x	x	x	x	x	x	x	x	x
IT.15.4.17	Explore the multimedia capabilities of the World Wide Web.	x	x	x	x	x	x	x	x	x
IT.15.4.18	Add plug-ins and helpers to the web browser.	x	x	x	x	x	x	x	x	x
IT.15.4.19	Explore collaboration tools.	x	x	x	x	x	x	x	x	x
IT.15.4.20	Participate in online audio and video conferencing.	x	x	x	x	x	x	x	x	x
IT.15.4.21	Archive files.	x	x	x	x	x	x	x	x	x
IT.15.4.22	Compile a collection of business sites (e.g., finance and investment).	x	x	x	x	x	x	x	x	x
IT.15.4.23	Explore electronic commerce.	x	x	x	x	x	x	x	x	x
	Web Page Design									
	INSPIRE>EBSCO Host>Business Source									
	Standard 16.1: *Demonstrate knowledge of web page basics.*									
IT.16.1.1	Differentiate between a client and a server.	x	x	x						
IT.16.1.2	Demonstrate knowledge of the role of browsers in reading files on the World Wide Web (text-only, hypertext).	x	x	x						

IT.16.1.3	Identify how different browsers affect the look of a web page.	x	x	x						
IT.16.1.4	Compare/contrast the features and functions of software editors available for designing web pages.	x	x	x	x	x	x	x	x	x
IT.16.1.5	Demonstrate knowledge of how bandwidths affect data transmission and on-screen image.	x	x	x						
IT.16.1.6	Demonstrate knowledge of the characteristics and uses of plug-ins.	x	x	x						
IT.16.1.7	Compare the advantages and disadvantages of running your own server vs. using a server provider.	x	x	x	x	x	x	x	x	x
	Standard 16.2: *Demonstrate knowledge of Internet programming basics.*									
IT.16.2.1	Recognize the importance of Internet programming standards.	x	x	x	x	x	x	x	x	x
IT.16.2.2	Demonstrate knowledge of standard Internet programming coding.	x	x	x						
IT.16.2.3	Demonstrate knowledge of special Internet programming feature codes (tags).	x	x	x						
IT.16.2.4	Differentiate between various versions of Internet programming.	x	x	x						
IT.16.2.5	Demonstrate knowledge of how to use standard word processing and page layout programs to produce an Internet application.	x	x	x						
IT.16.2.6	Identify authoring programs specifically designed for Internet programming production (e.g., Corel Xara, Microsoft FrontPage, Dreamweaver).	x	x	x	x	x	x	x	x	x
IT.16.2.7	Locate free Internet programming authoring programs on the Internet.	x	x	x	x	x	x	x	x	x
IT.16.2.8	Compare/contrast features, strengths, and weaknesses of different authoring programs.	x	x	x	x	x	x	x	x	x
IT.16.2.9	Identify cross-platform issues.	x	x	x						
IT.16.2.10	Keep up-to-date with new and emerging trends related to Internet programming.	x	x	x	x	x	x	x	x	x
	Standard 16.3: *Apply knowledge of basic web programming.*									
IT.16.3.1	Demonstrate knowledge of the purpose of web content delivery enablers (e.g., CGI, API, SSI).	x	x	x						
IT.16.3.2	Demonstrate knowledge of how to interface client/server.	x	x	x	x	x	x	x	x	x
IT.16.3.3	Demonstrate knowledge of client-side processing and its advantages/disadvantages.	x	x	x	x	x	x	x	x	x
IT.16.3.4	Identify security issues related to client-side processing.	x	x	x	x	x	x	x	x	x
IT.16.3.5	Identify standard scripting languages (e.g., JavaScript, Visual Basic Script, ActiveX, DHTML, XHTML).	x	x	x						
IT.16.3.6	Demonstrate knowledge of the uses and advantages/disadvantages of various scripting languages.	x	x	x						
IT.16.3.7	Demonstrate knowledge of how to use a scripting language to program a site.	x	x	x						
IT.16.3.8	Demonstrate knowledge of how to use advanced communication protocols.	x	x	x						
IT.16.3.9	Demonstrate knowledge of XML..	x	x	x						
	Standard 16.4: *Apply knowledge of web hosting.*									
IT.16.4.1	Compare the advantages and disadvantages of running your own server vs. using a server provider.	x	x	x	x	x	x	x	x	x
IT.16.4.2	Identify hardware requirements for a server.	x	x	x						
IT.16.4.3	Identify server software options.	x	x	x						
IT.16.4.4	Evaluate server providers.	x	x	x	x	x	x	x	x	x
IT.16.4.5	Establish a domain name.	x	x	x	x	x	x	x	x	x
IT.16.4.6	Comply with TCP/IP (Transfer Control Protocol/Internet Protocol).	x	x	x	x	x	x	x	x	x
IT.16.4.7	Upload files to the server.	x	x	x						
IT.16.4.8	Publicize the site (e.g., submit announcements to major search engines).	x	x	x	x	x	x	x	x	x
IT.16.4.9	Collect/analyze usage statistics.	x	x	x		x	x	x	x	x
	Standard 16.5: *Create/maintain a basic Web document using appropriate tool(s)..*									
IT.16.5.1	Open up a workspace to create a new Internet programming document.	x	x	x	x	x	x	x	x	x
IT.16.5.2	Create the basic Internet programming structure for a web page using a text editor.	x	x	x	x	x	x	x	x	x
IT.16.5.3	Demonstrate knowledge of the advantages of creating short multiple web pages rather than a single, long web page.	x	x	x						
IT.16.5.4	Determine logical points to split information into multiple web pages.	x	x	x						
IT.16.5.5	Create a template file using a text editor.	x	x	x	x	x	x	x	x	x
IT.16.5.6	Make appropriate changes to template file to create individual pages.	x	x	x			x			

IT.16.5.7	Insert nondisplayed comments into Internet programming files.	x	x	x			x			
IT.16.5.8	Display document within a web browser.	x	x	x						
IT.16.5.9	Make text modifications using a text editor.	x	x	x						
IT.16.5.10	Place different-level headings within document using appropriate Internet programming tags.	x	x	x						
IT.16.5.11	Insert paragraph breaks into the text of document using appropriate Internet programming tag.	x	x	x						
IT.16.5.12	Manipulate text cut and paste functions.	x	x	x						
IT.16.5.13	Insert a stylized footer at the bottom of a page.	x	x	x						
IT.16.5.14	Format text.	x	x	x						
IT.16.5.15	Create lists.	x	x	x			x			
IT.16.5.16	Add graphics/images using good design techniques or storyboarding.	x	x	x	x	x	x	x	x	x
IT.16.5.17	Add animation.	x	x	x	x	x	x	x	x	x
	Standard 16.6: *Format page layout.*									
IT.16.6.1	Demonstrate knowledge of Internet programming codes for formatting page layout.	x	x	x						
IT.16.6.2	Create a solid color background.	x	x	x						
IT.16.6. 3	Calculate the hexadecimal code for a color value.	x	x	x						
IT.16.6.4	Change the color of text and hypertext link items.	x	x	x						
IT.16.6.5	Create a textured background using a graphic file.	x	x	x						
IT.16.6.6	Create various types of hard rule lines for page dividers (e.g., different thicknesses and widths, with and without 3-D shading).	x	x	x						
IT.16.6.7	Create a table with rows and columns of text in a gridded display.	x	x	x			x			
IT.16.6.8	Create a layout scheme integrating text and pictures.	x	x	x			x			
IT.16.6.9	Create an invisible table with side-by-side columns.	x	x	x			x			
IT.16.6.10	Create a table that has different colored cells.	x	x	x			x			
IT.16.6.11	Demonstrate knowledge of interface design.	x	x	x			x			
IT.16.6.12	Display interlaced images.	x	x	x						
IT.16.6.13	Organize information using frames.	x	x	x						
	Standard 16.7: *Add audio* and video to a web page.									
IT.16.7.1	Demonstrate knowledge of how to deliver audio and video signals in real time (streaming).	x	x	x						
IT.16.7.2	Demonstrate knowledge of audio sweetening techniques.	x	x	x						
IT.16.7.3	Demonstrate knowledge of audio and video compression techniques.	x	x	x						
IT.16.7.4	Add audio and video to a web page using Internet programming codes.	x	x	x	x	x	x	x	x	x
IT.16.7.5	Establish network administration procedures for audio and video.	x	x	x						
IT.16.7.6	Define differences in formats.	x	x	x						
	Standard 16.8: *Link documents.*									
IT.16.8.1	Identify the function of URLs (Uniform Resource Locators).	x	x	x						
IT.16.8.2	Recognize the structure of a URL.	x	x	x						
IT.16.8.3	Copy URLs from a web browser to an Internet programming text document.	x	x	x						
IT.16.8.4	Write an Internet programming anchor to link to another document in the same directory as the first document.	x	x	x	x	x	x	x	x	x
IT.16.8.5	Write an Internet programming anchor to link to another document in a different directory from the first document.	x	x	x	x	x	x	x	x	x
IT.16.8.6	Write an Internet programming anchor to link to another web document on the Internet.	x	x	x	x	x	x	x	x	x
IT.16.8.7	Write an Internet programming anchor to link to files.	x	x	x	x	x	x	x	x	x
IT.16.8.8	Write an Internet programming anchor that links to another section of the same document.	x	x	x	x	x	x	x	x	x
IT.16.8.9	Incorporate a graphic that acts as a hyperlink to another document.	x	x	x	x	x	x	x	x	x
IT.16.8.10	Identify the significance of a file called index.html on a web server.	x	x	x						
IT.16.8.11	Create a hypertext link that will send an e-mail message.	x	x	x	x	x	x	x	x	x

IT.16.8.12	Differentiate between client-side image mapping and server-side image mapping.	x	x	x	x	x	x	x	x	x
IT.16.8.13	Create an inline image that has different portions hyperlinked to other web pages, pictures, and other sites on the Internet.	x	x	x	x	x	x	x	x	x
IT.16.8.14	Create hyperlinks for the use of plug-ins.	x	x	x	x	x	x	x	x	x
	Interactive Multimedia Production									
	INSPIRE>EBSCO Host>MasterFILE									
	Standard 17.1: *Demonstrate knowledge of interactive media.*									
IT.17.1.1	Demonstrate knowledge of interactive media components.	x	x	x						
IT.17.1.2	Identify the major characteristics of interactive media presentations.	x	x	x						
IT.17.1.3	Identify the important historical developments leading to contemporary interactive media.	x	x	x	x	x	x	x	x	x
IT.17.1.4	Demonstrate knowledge of various interactive media industry genres.	x	x	x	x	x	x	x	x	x
IT.17.1.5	Perform critical review of various interactive media end products.	x	x	x	x	x	x	x	x	x
IT.17.1.6	Identify rights, responsibilities, and controls related to various interactive media.	x	x	x	x	x	x	x	x	x
IT.17.1.7	Interpret intellectual property laws relative to interactive media.	x	x	x	x	x	x	x	x	x
IT.17.1.8	Analyze the social and cultural implications of interactive media.	x	x	x	x	x	x	x	x	x
IT.17.1.9	Identify key criticisms of interactive media.	x	x	x	x	x	x	x	x	x
IT.17.1.10	Identify possible markets for interactive media (e.g., sales and marketing, interactive advertising, K-12 education, corporate training, corporate communications, distance learning, news, entertainment).	x	x	x	x	x	x	x	x	x
IT.17.1.11	Identify specific uses of interactive media in each potential market.	x	x	x	x	x	x	x	x	x
IT.17.1.12	Identify future trends in interactive media.	x	x	x	x	x	x	x	x	x
	Standard 17.2: *Produce interactive media as a member of a development team.*									
IT.17.2.1	Define the role of individual team members.	x	x	x	x	x	x	x	x	x
IT.17.2.2	Develop a conceptual model for the interactive media project.	x	x	x	x	x	x	x	x	x
IT.17.2.3	Select appropriate hardware tools.	x	x	x			x			
IT.17.2.4	Select appropriate software tools.	x	x	x			x			
IT.17.2.5	Select the media elements (e.g., sound, video, graphics, text, animation) to be used.	x	x	x	x	x	x	x	x	x
IT.17.2.6	Integrate media elements.	x	x	x	x	x	x	x	x	x
IT.17.2.7	Select the publication process to be used.	x	x	x	x	x	x	x	x	x
IT.17.2.8	Select the distribution method to be used.	x	x	x	x	x	x	x	x	x
IT.17.2.9	Justify decisions made.	x	x	x	x	x	x	x	x	x
	Standard 17.3: *Pursue interactive media career opportunities.*									
IT.17.3.1	Identify potential career areas in interactive media.	x	x	x	x	x	x	x	x	x
IT.17.3.2	Identify components of portfolio.	x	x	x	x	x	x	x	x	x
IT.17.3.3	Establish criteria for portfolio components.	x	x	x	x	x	x	x	x	x
IT.17.3.4	Select appropriate materials/projects for inclusion in a completed portfolio.	x	x	x	x	x	x	x	x	x
	Standard 17.4: *Develop project concept proposal.*									
IT.17.4.1	Determine purpose of the interactive media project.	x	x	x						
IT.17.4.2	Determine the target audience.	x	x	x	x	x	x	x	x	x
IT.17.4.3	Determine objectives.	x	x	x						
IT.17.4.4	Research the content.	x	x	x	x	x	x	x	x	x
IT.17.4.5	Develop a design brief.	x	x	x	x	x	x	x	x	x
IT.17.4.6	Select appropriate message design (e.g., instructional, informational, entertainment).	x	x	x	x	x	x	x	x	x
IT.17.4.7	Determine the setting where the message will be used.	x	x	x	x	x	x	x	x	x
IT.17.4.8	Determine the interactive media elements to be used.	x	x	x	x	x	x	x	x	x
IT.17.4.9	Determine degree of interactivity desired.	x	x	x	x	x	x	x	x	x

IT.17.4.10	Identify available media and content sources.	x	x	x	x	x	x	x	x	x
IT.17.4.11	Decide whether to produce or acquire content (graphics, animation, audio, video, simulations, virtual environments).	x	x	x	x	x	x	x	x	x
IT.17.4.12	Develop time line for completion.	x	x	x	x	x	x	x	x	x
IT.17.4.13	Develop project budget.	x	x	x	x	x	x	x	x	x
IT.17.4.14	Write proposal.	x	x	x	x	x	x	x	x	x
	Standard 17.5: *Meet client needs.*									
IT.17.5.1	Determine client's needs and expected outcomes.	x	x	x	x	x	x	x	x	x
IT.17.5.2	Prepare cost estimate for client.	x	x	x	x	x	x	x	x	x
IT.17.5.3	Obtain client approvals throughout project.	x	x	x	x	x	x	x	x	x
	Standard 17.6: *Develop storyboards to communicate ideas.*									
IT.17.6.1	Make preliminary sketches showing placement of images and text on screen.	x	x	x		x	x		x	
IT.17.6.2	Show placement of buttons/navigational graphics.	x	x	x						
IT.17.6.3	Provide information on color schemes.	x	x	x						
IT.17.6.4	Provide information on lighting.	x	x	x						
IT.17.6.5	Provide a sample screen.	x	x	x			x			
	Standard 17.7: *Develop flowchart/navigational blueprints.*									
IT.17.7.1	Develop flowcharts with radial branching.	x	x	x	x	x	x	x	x	x
IT.17.7.2	Develop flowcharts with linear branching.	x	x	x	x	x	x	x	x	x
IT.17.7.3	Develop flowcharts with linking/nonlinear branching.	x	x	x	x	x	x	x	x	x
	Standard 17.8: *Write scripts.*									
IT.17.8.1	Describe music to be used.	x	x	x		x		x	x	
IT.17.8.2	Describe video (still and motion).	x	x	x		x		x	x	
IT.17.8.3	Describe special effects (video and audio).	x	x	x		x		x	x	
IT.17.8.4	Write narration and actor lines.	x	x	x	x	x	x	x	x	x
IT.17.8.5	Describe scenes.	x	x	x		x		x		
	Standard 17.9: *Combine media elements to produce an interactive multimedia project.*									
IT.17.9.1	Apply visual design skills.	x	x	x						
IT.17.9.2	Generate text for multi-image presentations (e.g., title slides, charts, graphs).	x	x	x						
IT.17.9.3	Create 2-D computer graphics.	x	x	x	x	x	x	x	x	x
IT.17.9.4	Create 3-D computer graphics.	x	x	x	x	x	x	x	x	x
IT.17.9.5	Create computer animation.	x	x	x	x	x	x	x	x	x
IT.17.9.6	Enhance interactive media presentation using a photographic process.	x	x	x			x			
IT.17.9.7	Integrate the use of photographic special effects into interactive media presentations.	x	x	x			x			
IT.17.9.8	Digitize photographic images for interactive media.	x	x	x			x			
IT.17.9.9	Alter digitized images using an image manipulation program.	x	x	x						
IT.17.9.10	Integrate photographically derived images with hand-drawn graphic images	x	x	x	x	x	x	x	x	x
IT.17.9.11	Acquire talent, if necessary.	x	x	x	x	x	x	x	x	x
IT.17.9.12	Coordinate work with the acquired talent.	x	x	x	x	x	x	x	x	x
IT.17.9.13	Create video footage.	x	x	x	x	x	x	x	x	x
IT.17.9.14	Digitize/edit video footage using computer video-editing software.	x	x	x			x			
IT.17.9.15	Record sound track, including narration, voice-overs, sound effects, and music.	x	x	x			x			
IT.17.9.16	Integrate sound with visuals.	x	x	x	x	x	x	x	x	x
IT.17.9.17	Build in hotspots and interactive links.	x	x	x			x			
IT.17.9.18	Synthesize available interactive media technologies into a unified presentation using appropriate authoring software.	x	x	x	x	x	x	x	x	x

	Standard 17.10: *Create interactive media applications.*									
IT.17.10.1	Produce an interactive media presentation (e.g., web-based, local).	x	x	x	x	x	x	x	x	x
IT.17.10.2	Produce computer-generated video.	x	x	x	x	x	x	x	x	x
IT.17.10.3	Produce a kiosk.	x	x	x	x	x	x	x	x	x
IT.17.10.4	Utilize video conferencing.	x	x	x	x	x	x	x	x	x
IT.17.10.5	Demonstrate computer-to-computer collaboration.	x	x	x	x	x	x	x	x	x
	Standard 17.11: *Maintain interactive media equipment.*									
IT.17.11.1	Demonstrate knowledge of proper care and handling procedures for interactive media equipment.	x	x	x						
IT.17.11.2	Perform pre- and post-production routines for presentations.	x	x	x	x	x	x	x	x	x
IT.17.11.3	Analyze equipment performance against industry standards.	x	x	x	x	x	x	x	x	x
IT.17.11.4	Troubleshoot simple equipment problems.	x	x	x						
	Standard 17.12: Test/*evaluate the functionality and content of the project.*									
IT.17.12.1	Test product.	x	x	x						
IT.17.12.2	Debug product.	x	x	x	x	x	x	x	x	x
	Hardware Design, Operation, and Maintenance									
	INSPIRE>Links>Business>Market Research									
	Standard 18.1: *Demonstrate knowledge of hardware standards.*									
IT.18.1.1	Identify standard-setting bodies.	x	x	x	x	x	x	x	x	x
IT.18.1.2	Identify OSI, IEEE, ISO, and ITU-T (formerly CCITT) standards.	x	x	x	x	x	x	x	x	x
IT.18.1.3	Demonstrate knowledge of the importance of conformance and use of operating system APIs (rather than direct manipulation of hardware).	x	x	x						
	Standard 18.2: *Analyze the computer site environment.*									
IT.18.2.1	Identify environmental requirements, conditions, and limitations.	x	x	x	x	x	x	x	x	x
IT.18.2.2	Identify power requirements and power supplies.	x	x	x	x	x	x	x	x	x
IT.18.2.3	Identify ergonomic issues.	x	x	x	x	x	x	x	x	x
IT.18.2.4	Identify structural capacities.	x	x	x						
IT.18.2.5	Identify electrical wiring codes.	x	x	x	x	x	x	x	x	x
	Standard 18.3: *Demonstrate knowledge of computer architecture and processor types.*									
IT.18.3.1	Demonstrate knowledge of microcomputer architecture and processors.	x	x	x					x	
IT.18.3.2	Compare/contrast the features of different microcomputer processors.	x	x	x			x		x	
IT.18.3.3	Demonstrate knowledge of minicomputer architecture and processors.	x	x	x					x	
IT.18.3.4	Demonstrate knowledge of mainframe architecture and processors.	x	x	x					x	
IT.18.3.5	Identify internal box components.	x	x	x					x	
IT.18.3.6	Compare/contrast system bus structures (e.g., ISA, EISA, MCA, PCI, USB).	x	x	x			x		x	
IT.18.3.7	Evaluate architecture alternatives.	x	x	x	x	x	x	x	x	x
	Standard 18.4: *Demonstrate basic knowledge of computer system architecture.*									
IT.18.4.1	Interpret terminology and acronyms related to computer systems architecture.	x	x	x					x	
IT.18.4.2	Identify the input, process, output and storage hardware required in a system.	x	x	x					x	
IT.18.4.3	Identify the basic organization of CPU architecture (e.g., Von Neumann, block diagram, data paths, control path, functional units, instruction cycles).	x	x	x					x	
IT.18.4.4	Demonstrate knowledge of multiprocessor architectures (e.g., single multiprocessing and distributed processing, stack, array, vector, multiprocessor, hypercube, client server, supercomputers).	x	x	x					x	
IT.18.4.5	Demonstrate knowledge of fundamentals of instruction-set types and architectures, including registers and RISC addressing modes.	x	x	x					x	

IT.18.4.6	Demonstrate knowledge of data-structure machine representations, including signed integers, character strings, stacks, records, and linked lists.	x	x	x					x	
IT.18.4.7	Demonstrate knowledge of the principles and operation of volatile and nonvolatile memory.	x	x	x					x	
IT.18.4.8	Demonstrate knowledge of the principles and operation of advanced memory techniques.	x	x	x					x	
IT.18.4.9	Demonstrate knowledge of standard input/output devices and systems.	x	x	x					x	
IT.18.4.10	Demonstrate knowledge of the I/O subsystem.	x	x	x					x	
IT.18.4.11	Demonstrate knowledge of machine-language instruction encoding.	x	x	x					x	
IT.18.4.12	Demonstrate knowledge of input/output techniques at the I/O driver level.	x	x	x					x	
IT.18.4.13	Demonstrate knowledge of the principles and operation of addresses and interrupt processing (e.g., CICS).	x	x	x					x	
IT.18.4.14	Identify low-level algorithms for conversion and data manipulation.	x	x	x					x	
IT.18.4.15	Demonstrate knowledge of assembly-language-level parameter-passing techniques.	x	x	x					x	
IT.18.4.16	Demonstrate knowledge of priorities and interrupts.	x	x	x					x	
IT.18.4.17	Demonstrate knowledge of direct-memory-access data-handling system(s).	x	x	x					x	
IT.18.4.18	Define functions of advanced memory techniques (e.g., virtual, pipeline, cache).	x	x	x					x	
IT.18.4.19	Demonstrate knowledge of how commands handle tasks in operating systems.	x	x	x					x	
IT.18.4.20	Identify the purpose of operating system utilities.	x	x	x					x	
IT.18.4.21	Identify the hardware components of a digital computer.	x	x	x					x	
IT.18.4.22	Demonstrate knowledge of instruction set design.	x	x	x					x	
IT.18.4.23	Demonstrate knowledge of the issues, principles, and essential building blocks in designing a processor.	x	x	x					x	
IT.18.4.24	Identify cost-performance issues and design trade-offs in building a computer system.	x	x	x					x	
	Standard 18.5: *Demonstrate knowledge of CPU components.*									
IT.18.5.1	Demonstrate knowledge of chip configuration and structure.	x	x	x					x	
IT.18.5.2	Identify the functions of internal components.	x	x	x					x	
IT.18.5.3	Demonstrate knowledge of the characteristics and operation of motherboards.	x	x	x					x	
IT.18.5.4	Demonstrate knowledge of the characteristics and operation of co-processor boards (e.g., math, graphics, fax, modems, voice).	x	x	x					x	
IT.18.5.5	Demonstrate knowledge of the characteristics and operation of controller cards.	x	x	x					x	
IT.18.5.6	Demonstrate knowledge of the characteristics and operation of network interface cards.	x	x	x					x	
IT.18.5.7	Demonstrate knowledge of the characteristics and operation of the PCMCIA bus (PC Card and CardBus).	x	x	x					x	
IT.18.5.8	Demonstrate knowledge of logic elements and switching theory, including minimization concepts and implementation of functions.	x	x	x					x	
IT.18.5.9	Demonstrate knowledge of propagation delays and hazards.	x	x	x					x	
IT.18.5.10	Demonstrate knowledge of the characteristics and operation of multiplexers, demultiplexers, decoders, encoders, adders, subtractors, comparators, shift registers and counters.	x	x	x					x	
IT.18.5.11	Differentiate between ROM, PROM, EPROM, EEPROM, RAM.	x	x	x			x		x	
IT.18.5.12	Differentiate between synchronous and asynchronous circuits.	x	x	x			x		x	
	Standard 18.6: *Demonstrate a basic knowledge of connectivity devices.*									
IT.18.6.1	Demonstrate knowledge of the characteristics and operation of baluns.	x	x	x					x	
IT.18.6.2	Demonstrate knowledge of the characteristics and operation of multiplexers, modems, CODECS, DSU.	x	x	x					x	
IT.18.6.3	Demonstrate knowledge of the characteristics and operation of switches, gateways, bridges, routers, brouters, and repeaters.	x	x	x					x	
IT.18.6.4	Demonstrate knowledge of the characteristics and operation of test equipment (e.g., protocol analyzers).	x	x	x					x	
	Standard 18.7: Explain operation of microprocessor systems.									
IT.18.7.1	Demonstrate knowledge of the essential components of microprocessor and the functions of each.	x	x	x					x	
IT.18.7.2	Demonstrate knowledge of the principles and operation of bus concepts (e.g., VESA, EISA).	x	x	x					x	

IT.18.7.3	Demonstrate knowledge of the principles and operation of different types of memory circuits.	x	x	x					x	
IT.18.7.4	Demonstrate knowledge of operating systems (e.g., UNIX, Windows, Windows NT, MVS).	x	x	x					x	
IT.18.7.5	Demonstrate knowledge of microprocessor instruction sets.	x	x	x					x	
IT.18.7.6	Demonstrate knowledge of the principles and operation of microprocessor machine code.	x	x	x					x	
IT.18.7.7	Demonstrate knowledge of types of input and output devices and peripherals.	x	x	x					x	
IT.18.7.8	Demonstrate knowledge of the principles and operation of storage devices.	x	x	x					x	
IT.18.7.9	Connect input and output ports to peripherals.	x	x	x					x	
IT.18.7.10	Demonstrate knowledge of central processing unit building blocks and their uses.	x	x	x					x	
	Standard 18.8: *Demonstrate knowledge of peripheral equipment.*									
IT.18.8.1	Demonstrate knowledge of peripheral I/O and interrupts.	x	x	x					x	
IT.18.8.2	Demonstrate knowledge of I/O control methods.	x	x	x					x	
IT.18.8.3	Demonstrate knowledge of external storage concepts, physical organization, and drives.	x	x	x					x	
IT.18.8.4	Demonstrate knowledge of the characteristics and functions of optical auxiliary storage.	x	x	x					x	
IT.18.8.5	Demonstrate knowledge of storage space allocation hierarchies.	x	x	x					x	
IT.18.8.6	Demonstrate knowledge of main memory organization, bus operations, and cycle times for selection and addressing.	x	x	x					x	
IT.18.8.7	Demonstrate knowledge of the characteristics and functions of read/write and cache memory.	x	x	x					x	
IT.18.8.8	Demonstrate knowledge of the characteristics and functions of virtual memory.	x	x	x					x	
IT.18.8.9	Identify interfaces between computers and other devices.	x	x	x					x	
IT.18.8.10	Define printer types and related interface controllers.	x	x	x					x	
IT.18.8.11	Demonstrate knowledge of the operation of typical magnetic tape equipment and interface controllers.	x	x	x					x	
IT.18.8.12	Demonstrate knowledge of disk equipment and related interface controllers.	x	x	x					x	
IT.18.8.13	Define environmental requirements for peripherals and media.	x	x	x	x	x	x	x	x	x
	Standard 18.9: *Design computer systems.*									
IT.18.9.1	Develop detailed design and interface specifications.	x	x	x	x	x	x	x	x	x
IT.18.9.2	Design human factor interface.	x	x	x	x	x	x	x	x	x
IT.18.9.3	Identify system platform, components, and dependencies.	x	x	x			x			
IT.18.9.4	Break down subsystems.	x	x	x						
IT.18.9.5	Develop physical data model.	x	x	x	x	x	x	x	x	x
IT.18.9.6	Participate in peer and formal design reviews (including validation).	x	x	x	x	x	x	x	x	x
IT.18.9.7	Identify maintenance requirements.	x	x	x						
IT.18.9.8	Create prototypes.	x	x	x	x	x	x	x	x	x
IT.18.9.9	Review/critique user documentation.	x	x	x	x	x	x	x	x	x
IT.18.9.10	Write/document code.	x	x	x	x	x	x	x	x	x
IT.18.9.11	Perform unit testing.	x	x	x						
IT.18.9.12	Analyze errors.	x	x	x	x	x	x	x	x	x
IT.18.9.13	Resolve errors.	x	x	x	x	x	x	x		
IT.18.9.14	Integrate subsystems.	x	x	x			x			
IT.18.9.15	Update detailed design and interface specifications.	x	x	x	x	x	x	x	x	x
IT.18.9.16	Participate in peer code review.	x	x	x	x	x	x	x	x	x
IT.18.9.17	Demonstrate knowledge of how to specify major subsystems and interfaces.	x	x	x						
IT.18.9.18	Demonstrate knowledge of how to select design methodology.	x	x	x						
IT.18.9.19	Demonstrate knowledge of how to select design tools.	x	x	x						
IT.18.9.20	Demonstrate knowledge of how to develop models (e.g., business, physical interface, logical data).	x	x	x						
IT.18.9.21	Demonstrate knowledge of how to validate architecture and models.	x	x	x						

	Standard 18.10: *Install computer system (e.g., monitor, keyboard, disk drive, and printer).*									
IT.18.10.1	Identify primary PC components and the functions of each.	x	x	x						
IT.18.10.2	Demonstrate knowledge of how hardware components interact and how conflicts arise.	x	x	x						
IT.18.10.3	Access needed information using manufacturers' references (e.g., procedural manuals, documentation, standards, work flowcharts).	x	x	x	x	x	x	x	x	x
IT.18.10.4	Secure supplies and resources.	x	x	x	x	x	x	x	x	x
IT.18.10.5	Respond to error messages and symptoms of hardware failures.	x	x	x	x	x	x	x	x	x
IT.18.10.6	Install boards to support peripherals.	x	x	x	x	x	x	x	x	x
IT.18.10.7	Connect peripherals to CPU.	x	x	x	x	x	x	x	x	x
IT.18.10.8	Employ appropriate safety precautions when working with PCs.	x	x	x	x	x	x	x	x	x
IT.18.10.9	Configure system.	x	x	x	x	x	x	x	x	x
IT.18.10.10	Verify system operation.	x	x	x			x			
IT.18.10.11	Document system installation activities.	x	x	x						
IT.18.10.12	Backup system configuration.	x	x	x						
IT.18.10.13	Test all applications.	x	x	x	x	x	x	x	x	x
	Standard 18.11: Troubleshoot computer systems.									
IT.18.11.1	Identify priorities and interrupts at system level.	x	x	x	x	x	x	x	x	x
IT.18.11.2	Demonstrate the use of volatile and nonvolatile memory.	x	x	x			x			
IT.18.11.3	Repair/replace volatile and nonvolatile memory.	x	x	x			x			
IT.18.11.4	Test system using diagnostic tools/software.	x	x	x			x			
IT.18.11.5	Identify problems in the operating system and related hardware.	x	x	x			x			
IT.18.11.6	Differentiate between hardware and software failure.	x	x	x			x			
IT.18.11.7	Update flash memory (BIOS).	x	x	x						
IT.18.11.8	Optimize hard drive.	x	x	x					x	
IT.18.11.9	Gather information on problem from user.	x	x	x	x	x	x	x	x	x
IT.18.11.10	Conduct appropriate diagnostic tests.	x	x	x			x		x	
IT.18.11.11	Repair/replace malfunctioning hardware.	x	x	x			x		x	
IT.18.11.12	Reinstall software as needed.	x	x	x					x	
IT.18.11.13	Recover data and/or files.	x	x	x			x		x	
IT.18.11.14	Restore system to normal operating standards.	x	x	x	x	x	x	x	x	x
	Operating Systems									
	INSPIRE>Links>Business>Business.com									
	Standard 19.1: *Describe system components.*									
IT.19.1.1	Demonstrate knowledge of central processing unit (CPU) control and architecture.	x	x	x					x	
IT.19.1.2	Demonstrate knowledge of operating system architecture types.	x	x	x			x		x	
IT.19.1.3	Identify operating system goals.	x	x	x					x	
IT.19.1.4	Demonstrate knowledge of operating system structuring methods, layered models, and the object-server model.	x	x	x					x	
IT.19.1.5	Differentiate between microcomputer, minicomputer, and mainframe operating systems.	x	x	x					x	
IT.19.1.6	Demonstrate knowledge of network operating systems.	x	x	x					x	
IT.19.1.7	Define the role of memory management in an operating system.	x	x	x					x	
IT.19.1.8	Demonstrate knowledge of the basics of process management.	x	x	x					x	
IT.19.1.9	Demonstrate knowledge of the commands used to handle tasks in operating systems.	x	x	x			x		x	
IT.19.1.10	Demonstrate knowledge of the system utilities used for file management.	x	x	x			x		x	
IT.19.1.11	Differentiate between a compiler and an interpreter.	x	x	x					x	
IT.19.1.12	Demonstrate knowledge of interface theory in an operating system.	x	x	x					x	

IT.19.1.13	Differentiate among platforms and determine the best method for application.	x	x	x			x		x	
	Standard 19.2: *Demonstrate knowledge of computer memory.*								x	
IT.19.2.1	Differentiate between memory types for PCs, mainframes, minicomputers, and networks.	x	x	x			x		x	
IT.19.2.2	Differentiate between the functions of extended memory, expanded memory, and cache memory.	x	x	x					x	
IT.19.2.3	Demonstrate knowledge of the role of the relationship between memory and software applications.	x	x	x					x	
IT.19.2.4	Demonstrate knowledge of memory management functions (e.g., contiguous allocation, paging, segmentation, virtual memory).	x	x	x					x	
IT.19.2.5	Demonstrate knowledge of the role of physical memory and registers.	x	x	x					x	
IT.19.2.6	Demonstrate knowledge of the role of overlays, swapping, partitions.	x	x	x					x	
IT.19.2.7	Demonstrate knowledge of the role of pages and segments.	x	x	x					x	
IT.19.2.8	Demonstrate knowledge of the role of free lists, layout, servers, interrupts, recovery from failures.	x	x	x					x	
	Standard 19.3: *Demonstrate knowledge of auxiliary storage.*									
IT.19.3.1	Demonstrate knowledge of operational characteristics of storage media.	x	x	x					x	
IT.19.3.2	Identify capacities of storage media.	x	x	x					x	
IT.19.3.3	Demonstrate knowledge of retrieval methods for storage media.	x	x	x					x	
IT.19.3.4	Differentiate between files and directories.	x	x	x					x	
IT.19.3.5	Differentiate between types of storage devices (e.g., disk, tape, CD-ROM).	x	x	x					x	
IT.19.3.6	Demonstrate knowledge of mirroring and RAID concepts.	x	x	x					x	
IT.19.3.7	Select storage management software to accommodate storage needs.	x	x	x					x	
IT.19.3.8	Select auxiliary storage media.	x	x	x					x	
IT.19.3.9	Demonstrate knowledge of compression techniques (e.g., data, image, video, audio).	x	x	x			x		x	
	Standard 19.4: *Maintain security requirements.*									
IT.19.4.1	Implement security procedures in accordance with business ethics.	x	x	x	x	x	x	x	x	x
IT.19.4.2	Ensure compliance with security rules, regulations, and codes.	x	x	x	x	x	x	x	x	x
IT.19.4.3	Maximize threat reduction.	x	x	x	x	x	x	x	x	x
IT.19.4.4	Assess exposure to security issues.	x	x	x	x	x	x	x	x	x
IT.19.4.5	Implement countermeasures.	x	x	x	x	x	x	x	x	x
IT.19.4.6	Maintain confidentiality.	x	x	x	x	x	x	x	x	x
IT.19.4.7	Load virus detection and protection software.	x	x	x	x	x	x	x	x	x
IT.19.4.8	Identify sources of virus infections.	x	x	x	x	x	x	x	x	x
IT.19.4.9	Remove viruses.	x	x	x			x			
IT.19.4.10	Report viruses in compliance with company standards.	x	x	x	x	x	x	x	x	x
IT.19.4. 11	Implement backup and recovery procedures.	x	x	x	x	x	x	x	x	x
IT.19.4.12	Demonstrate knowledge of potential internal and external threats to security.	x	x	x	x	x	x	x	x	x
IT.19.4.13	Follow disaster plan.	x	x	x	x	x	x	x	x	x
IT.19.4.14	Provide for user authentication (e.g., assign passwords, access level).	x	x	x	x	x	x	x	x	x
IT.19.4.15	Demonstrate knowledge of virus protection strategy.	x	x	x	x	x	x	x	x	x
IT.19.4.16	Document security procedures.	x	x	x	x	x	x	x	x	x
	Standard 19.5: *Operate system.*									
IT.19.5.1	Apply basic commands of operating system software.	x	x	x					x	
IT.19.5.2	Apply appropriate file and disk management techniques.	x	x	x					x	
IT.19.5.3	Employ desktop operating skills.	x	x	x					x	
IT.19.5.4	Handle materials and equipment in a responsible manner.	x	x	x	x	x	x	x	x	x
IT.19.5.5	Secure needed supplies and resources.	x	x	x	x	x	x	x	x	x
IT.19.5.6	Access needed information using appropriate reference materials.	x	x	x	x	x	x	x	x	x

IT.19.5.7	Review automated scheduling software.	x	x	x	x	x	x	x	x	x
IT.19.5.8	Identify data requirements.	x	x	x					x	
IT.19.5.9	Follow power-up and log-on procedures.	x	x	x					x	
IT.19.5.10	Interact with/respond to system messages using console device.	x	x	x			x		x	
IT.19.5.11	Run applications/jobs in accordance with processing procedures.	x	x	x			x		x	
IT.19.5.12	Identify scheduling priority in programming.	x	x	x			x		x	
IT.19.5.13	Develop audit trails.	x	x	x	x	x	x	x	x	x
IT.19.5.14	Build system software command structures using operating system macro facilities for computer systems.	x	x	x	x	x	x	x	x	x
IT.19.5.15	Follow log-off and power-down procedure(s).	x	x	x			x		x	
	Standard 19.6: *Maintain system.*									
IT.19.6.1	Access needed information using appropriate reference materials.	x	x	x	x	x	x	x	x	x
IT.19.6.2	Handle materials and equipment in a responsible manner.	x	x	x	x	x	x	x	x	x
IT.19.6.3	Monitor system status and performance.	x	x	x					x	
IT.19.6.4	Run diagnostics.	x	x	x					x	
IT.19.6.5	Respond to system messages.	x	x	x					x	
IT.19.6.6	Document computer system malfunction(s).	x	x	x	x	x	x	x	x	x
IT.19.6.7	Document software malfunction(s).	x	x	x	x	x	x	x	x	x
IT.19.6.8	Fix recoverable problems.	x	x	x	x	x	x	x	x	x
IT.19.6.9	Perform preventive maintenance procedures on computer and peripheral devices.	x	x	x	x	x	x	x	x	x
IT.19.6.10	Install software packages.	x	x	x	x	x	x	x	x	x
IT.19.6.11	Restore system.	x	x	x	x	x	x	x	x	x
IT.19.6.12	Optimize windows environment to maximize performance of desktop resources.	x	x	x	x	x	x	x	x	x
IT.19.6.13	Review automated scheduling software.	x	x	x					x	
IT.19.6.14	Create and use logical files.	x	x	x	x	x	x	x	x	x
IT.19.6.15	Create a query to extract information from a file.	x	x	x	x	x	x	x	x	x
IT.19.6.16	Create a query to extract information from multiple files.	x	x	x	x	x	x	x	x	x
IT.19.6.17	Create reports from queries.	x	x	x	x	x	x	x	x	x
IT.19.6.18	Develop a display screen for use with a high-level language program.	x	x	x	x	x	x	x	x	x
	Standard 19.7: *Perform standard computer backup procedures.*									
IT.19.7.1	Recognize the need for regular backup procedures.	x	x	x			x		x	
IT.19.7.2	Develop backup process.	x	x	x			x		x	
IT.19.7.3	Load backup software.	x	x	x			x		x	
IT.19.7.4	Perform restore operation using backup software.	x	x	x			x		x	
IT.19.7.5	Load compression drive backup software.	x	x	x			x		x	
IT.19.7.6	Perform restore operation using compression drive backup software.	x	x	x			x		x	
IT.19.7.7	Identify battery backup equipment.	x	x	x			x		x	
IT.19.7.8	Maintain battery backup system.	x	x	x			x		x	
IT.19.7.9	Install surge suppression protection.	x	x	x			x		x	
	Standard 19.8: *Provide support and training.*									
IT.19.8.1	Operate help desk.	x	x	x	x	x	x	x	x	x
IT.19.8.2	Employ desktop productivity tools.	x	x	x	x	x	x	x	x	x
IT.19.8.3	Support computer users.	x	x	x	x	x	x	x	x	x
IT.19.8.4	Train computer users.	x	x	x	x	x	x	x	x	x
IT.19.8.5	Support Network Operating Center (NOC).	x	x	x	x	x	x	x	x	x

	Standard 19.9: *Employ computer system interfaces.*									
IT.19.9.1	Define hardware-software interface issues for a computer system.	x	x	x					x	
IT.19.9.2	Identify standards and issues related to I/O programming and design of I/O interfaces.	x	x	x					x	
IT.19.9.3	Interface peripheral devices/controllers in the computer system (e.g., software and hardware interrupts, exceptions, Direct Memory Addressing [DMA], bus structures).	x	x	x	x	x	x	x	x	x
IT.19.9.4	Apply concepts of privileged instructions and protected mode programming.	x	x	x					x	
IT.19.9.5	Configure peripheral device drivers (e.g., disk, display, printer, modem, keyboard, mouse, network).	x	x	x	x	x	x	x	x	x
IT.19.9.6	Apply advanced I/O concepts (e.g., disk caching, data compression, extended memory, magnetic disk/CD-ROM storage and formats).	x	x	x	x	x	x	x	x	x
IT.19.9.7	Identify CPU modes of operations.	x	x	x					x	
IT.19.9.8	Allocate disk space, nonsharable resources, and I/O devices.	x	x	x	x	x	x	x	x	x
IT.19.9.9	Update drivers from Internet.	x	x	x	x	x	x	x	x	x
	Standard 19.10: *Demonstrate knowledge of advanced operating system concepts and mechanisms.*									
IT.19.10.1	Identify techniques and language primitives for process synchronization.	x	x	x					x	
IT.19.10.2	Identify techniques and algorithms for deadlock-handling and distributed mutual exclusion.	x	x	x					x	
IT.19.10.3	Identify techniques and distributed algorithms for fault-tolerance and concurrency control.	x	x	x					x	
IT.19.10.4	Demonstrate knowledge of concepts of distributed time and space.	x	x	x					x	
IT.19.10.5	Identify correctness proofs for concurrent systems.	x	x	x					x	
IT.19.10.6	Demonstrate knowledge of how to create, compile and test a control language program.	x	x	x					x	
	Networking									
	INSPIRE>EBSCO Host>MasterFILE									
	Standard 20.1: *Demonstrate knowledge of basic network classifications and topologies.*									
IT.20.1.1	Interpret basic networking terminology.	x	x	x						
IT.20.1.2	Differentiate between LANs, MANs and WANs.	x	x	x						
IT.20.1.3	Demonstrate knowledge of how to turn LANs into MANs and WANs.	x	x	x	x	x	x	x	x	x
IT.20.1.4	Identify the basic point-to-point network topologies (e.g., star, ring, tree, network, irregular).	x	x	x						
IT.20.1.5	Demonstrate knowledge of packet-switching techniques.	x	x	x						
IT.20.1.6	Identify the basic broadcast topologies (e.g., star ring, bus).	x	x	x						
IT.20.1.7	Demonstrate knowledge of the characteristics of connection-oriented and connectionless networks.	x	x	x					x	
IT.20.1.8	Identify standard high-speed networks (e.g., broadband, ISDN, SMDS, ATM, FDDI).	x	x	x						
IT.20.1.9	Identify emerging networks (e.g., ATM; ISDN; satellite nets; optic nets; integrated voice, data, and video).	x	x	x						
	Standard 20.2: *Demonstrate knowledge of local-area network (LAN) trends and issues.*									
IT.20.2.1	Demonstrate knowledge of the reasons for installing a network.	x	x	x					x	
IT.20.2.2	Trace the evolution of networks.	x	x	x					x	
IT.20.2.3	Analyze current trends and developments in LANs.	x	x	x	x	x	x	x	x	x
	Standard 20.3: *Demonstrate knowledge of common network computing platforms.*									
IT.20.3.1	Differentiate between personal computers and workstations.	x	x	x				x		
IT.20.3.2	Identify the basic features of standard microprocessors (e.g., Intel family, RISC, Cyrix).	x	x	x						
IT.20.3.3	Identify standard memory types (e.g., RAM, ROM, PROM, EPROM, EEPROM).	x	x	x						
IT.20.3.4	Identify standard input/output devices (e.g., ISA, EISA, Micro Channel, PCI, universal serial bus, drive controllers, SCSI and SCSI 2, PCMCIA, firewire).	x	x	x						
IT.20.3.5	Identify the basic features of standard operating systems (e.g., Windows 3.1, 95, 98, CE, Workgroups, NT; OS/2; Macintosh OS; Solaris).	x	x	x						
IT.20.3.6	Identify the basic features of standard workstation processors.	x	x	x						
IT.20.3.7	Identify standard CPU architectures for mid-range computers.	x	x	x						

IT.20.3.8	Identify standard operating system software for mid-range computers.	x	x	x							
IT.20.3.9	Identify basic mainframe capabilities.	x	x	x							
IT.20.3.10	Identify basic mainframe attributes (e.g., size, system capacity, processor speeds, fault tolerance, security, transaction processing).	x	x	x							
IT.20.3.11	Identify common mainframe vendors (e.g., IBM, Amdahl, Hitachi Data Systems, Digital).	x	x	x							
	Standard 20.4: *Demonstrate knowledge of LAN physical media.*										
IT.20.4.1	Differentiate between baseband and broadband transmission.	x	x	x							
IT.20.4.2	Demonstrate knowledge of Manchester encoding.	x	x	x	x	x	x	x	x	x	
IT.20.4.3	Identify the criteria used in making cable selection decisions (e.g., physical properties, transmission technologies, transmission span, bandwidth, topology, security, noise immunity, installation considerations, cost).	x	x	x							
IT.20.4.4	Demonstrate knowledge of cable types (e.g., coaxial, twisted-pair, optical fibers).	x	x	x			x				
IT.20.4.5	Compare/contrast a cable types.	x	x	x			x				
IT.20.4.6	Demonstrate knowledge of types of cable connectors and grounding techniques.	x	x	x			x				
IT.20.4.7	Demonstrate knowledge of typical cable applications.	x	x	x			x				
IT.20.4.8	Demonstrate knowledge of cable standards (e.g., ANSI, EIA/TIA-568, EIA/TIA-569, TWSS, NEC).	x	x	x			x				
IT.20.4.9	Identify the advantages and disadvantages of LAN cabling systems.	x	x	x			x				
IT.20.4.10	Demonstrate knowledge of LAN system physical layouts.	x	x	x			x				
IT.20.4.11	Demonstrate knowledge of how to conduct cable installation site survey.	x	x	x			x				
IT.20.4.12	Demonstrate knowledge of how to estimate cable and components required based on installation site survey results.	x	x	x	x	x	x	x	x	x	
IT.20.4.13	Demonstrate knowledge of checks that need to be made prior to installing cable.	x	x	x					x		
IT.20.4.14	Demonstrate knowledge of the documentation and labeling needed when installing cable.	x	x	x					x		
IT.20.4.15	Demonstrate knowledge of accepted methods for installing cable.	x	x	x					x		
IT.20.4.16	Demonstrate knowledge of typical problems associated with cable installation.	x	x	x					x		
IT.20.4.17	Demonstrate knowledge of cable testing and tolerance levels.	x	x	x					x		
IT.20.4.18	Demonstrate knowledge of possible sources of interference and methods for overcoming each	x	x	x					x		
IT.20.4.19	Demonstrate knowledge of basic cabling schemes and alternatives.	x	x	x					x		
	Standard 20.5: *Demonstrate knowledge of network connectivity basics.*										
IT.20.5.1	Demonstrate knowledge of the characteristics and functions of point-to-point channels, switched, and meshed network.	x	x	x					x		
IT.20.5.2	Demonstrate knowledge of the characteristics and functions of broadcast channels.	x	x	x					x		
IT.20.5.3	Identify software used to connect networking devices.	x	x	x					x		
IT.20.5.4	Demonstrate knowledge of types of interoperability (e.g., peer-to-peer, peer-to-host).	x	x	x	x	x	x	x	x	x	
IT.20.5.5	Demonstrate knowledge of Internet, Intranet, and Extranet usage and connectivity.	x	x	x	x	x	x	x	x	x	
	Standard 20.6: *Differentiate processes, services, and protocols.*										
IT.20.6.1	Demonstrate knowledge of protocol concepts (e.g., converters, basic layering concepts, peer communication, routing, stacks/suites).	x	x	x	x	x	x	x	x	x	
IT.20.6.2	Differentiate between a process and a protocol.	x	x	x					x		
IT.20.6.3	Demonstrate knowledge of standard types of cooperative processes (e.g., peer-to-peer, client server, master-slave).	x	x	x	x	x	x	x	x	x	
IT.20.6.4	Identify the advantages and disadvantages of standard protocols.	x	x	x					x		
IT.20.6.5	Demonstrate knowledge of the purposes of, and procedures for, encapsulation and decapsulation.	x	x	x					x		
IT.20.6.6	Demonstrate knowledge of network address protocols (e.g., frame, packet, process).	x	x	x					x		
	Standard 20.7: *Demonstrate knowledge of the Open Systems Interconnection (OSI) standard (ISO Standard 7498).*										
IT.20.7.1	Identify the benefits of using a layered network model.	x	x	x	x				x		

IT.20.7.2	Identify the seven layers at which decisions must be made according to the OSI standard.	x	x	x	x				x	
IT.20.7.3	Demonstrate knowledge of OSI stack positions and their relationship to one another.	x	x	x	x				x	
IT.20.7.4	Demonstrate knowledge of the decisions to be made in the OSI physical layer (Layer 1).	x	x	x	x				x	
IT.20.7.5	Demonstrate knowledge of the decisions to be made in the OSI data link layer (Layer 2).	x	x	x	x				x	
IT.20.7.6	Demonstrate knowledge of the decisions to be made in the OSI network layer (Layer 3).	x	x	x	x				x	
IT.20.7.7	Demonstrate knowledge of the decisions to be made in the OSI transport layer (Layer 4).	x	x	x	x				x	
IT.20.7.8	Differentiate between how OSI Layers 1-4 and Layers 5-7.	x	x	x	x				x	
IT.20.7.9	Demonstrate knowledge of the decisions to be made in the OSI session layer (Layer 5).	x	x	x	x				x	
IT.20.7.10	Demonstrate knowledge of the decisions to be made in the OSI presentation layer (Layer 6).	x	x	x	x				x	
IT.20.7.11	Demonstrate knowledge of the decisions to be made in the OSI application layer (Layer 7).	x	x	x	x				x	
	Standard 20.8: *Demonstrate knowledge of communication standards for networks.*									
IT.20.8.1	Demonstrate knowledge of digital data communication techniques and standards, including asynchronous and synchronous transmission, error detection and correction codes, and physical interfaces (e.g., RS-232, RS-422).	x	x	x	x	x	x	x	x	x
IT.20.8.2	Identify software standards for subnet, presentation layers, and file servers.	x	x	x					x	
IT.20.8.3	Demonstrate knowledge of data-transmission basics.	x	x	x					x	
IT.20.8.4	Demonstrate knowledge of data-encoding basics.	x	x	x					x	
IT.20.8.5	Demonstrate knowledge of the binary numbering system.	x	x	x					x	
IT.20.8.6	Demonstrate knowledge of the hexidecimal system.	x	x	x					x	
IT.20.8.7	Convert binary numbers to decimal equivalents and vice versa.	x	x	x					x	
IT.20.8.8	Demonstrate knowledge of the ASCII representation of characters.	x	x	x					x	
IT.20.8.9	Demonstrate knowledge of the EBCDIC representation of characters.	x	x	x					x	
IT.20.8.10	Convert ASCII characters to EBCDIC equivalents and vice versa.	x	x	x	x	x	x	x	x	x
	Network Architectures									
	INSPIRE>Indiana Links>Business>Indiana Business Magazine									
	Standard 21.1: *Demonstrate knowledge of the basics of network architecture.*									
IT.21.1.1	Demonstrate knowledge of the characteristics and uses of network components (e.g., hub, switches, routers, firewall).	x	x	x			x		x	
IT.21.1.2	Identify LAN transmission methods (e.g., bus, pure ring, star ring topologies).	x	x	x			x		x	
IT.21.1.3	Demonstrate knowledge of broadband and baseband transmission methods and standards.	x	x	x			x		x	
IT.21.1.4	Demonstrate knowledge of LAN transmission logic.	x	x	x			x		x	
IT.21.1.5	Identify LAN transmission media (e.g., twisted pair, fiber-optic cable, wireless).	x	x	x			x		x	
IT.21.1.6	Demonstrate knowledge of LAN medium-access protocols (e.g., CSMA/CD, token bus, token ring, FDDI).	x	x	x			x		x	
IT.21.1.7	Identify the components of, and relationships within, the OSI 8802 (IEEE 802) protocol suite.	x	x	x			x		x	
IT.21.1.8	Demonstrate knowledge of LAN protocol issues with medium-access control and data communications protocol.	x	x	x			x		x	
IT.21.1.9	Identify LAN performance factors (signal attenuation, signal propagation delay).	x	x	x			x		x	
IT.21.1.10	Compare/contrast various frame formats for LANs.	x	x	x			x		x	
IT.21.1.11	Demonstrate knowledge of frame types (e.g., SNS<802.3, 802.5).	x	x	x			x		x	
IT.21.1.12	Demonstrate a basic knowledge of OSI modeling.	x	x	x			x		x	
IT.21.1.13	Differentiate between a physical and logical topology.	x	x	x			x		x	
	Standard 21.2: *Demonstrate knowledge of the basics of Ethernet technology.*									
IT.21.2.1	Demonstrate knowledge of available Ethernet topology.	x	x	x			x		x	
IT.21.2.2	Demonstrate knowledge of the Ethernet media-access algorithm.	x	x	x			x		x	
IT.21.2.3	Demonstrate knowledge of basic Ethernet configurations (e.g., simple, hub, hubs and bridges, server, switch).	x	x	x			x		x	
IT.21.2.4	Evaluate the advantages and disadvantages of an Ethernet network.	x	x	x			x		x	

	Standard 21.3: *Demonstrate knowledge of the basics of token ring technology.*									
IT.21.3.1	Demonstrate knowledge of the characteristics of a token ring network.	x	x	x			x		x	
IT.21.3.2	Demonstrate knowledge of token ring information-flow/media-access control.	x	x	x			x		x	
IT.21.3.3	Demonstrate knowledge of the token ring send algorithm.	x	x	x			x		x	
IT.21.3.4	Identify token ring configurations (simple, IBM host).	x	x	x			x		x	
IT.21.3.5	Evaluate the advantages and disadvantages of a token ring network.	x	x	x			x		x	
	Standard 21.4: *Demonstrate knowledge of the basics of token bus, Fiber Distributed-Data Interface (FDDI), and wireless LAN technology.*									
IT.21.4.1	Identify token bus configuration.	x	x	x			x		x	
IT.21.4.2	Evaluate token bus advantages and disadvantages.	x	x	x			x		x	
IT.21.4.3	Demonstrate knowledge of Fiber Distributed-Data Interface (FDDI) technology.	x	x	x			x		x	
IT.21.4.4	Identify the key components of wireless LAN technology (e.g., spread-spectrum radio, infrared light, narrow-band radio).	x	x	x			x		x	
IT.21.4.5	Evaluate the advantages and disadvantages of a wireless LAN.	x	x	x			x		x	
	Standard 21.5: *Demonstrate knowledge of the TCP/IP protocol.*									
IT.21.5.1	Demonstrate knowledge of the basics of TCP/IP layers, components, and functions.	x	x	x			x		x	
IT.21.5.2	Identify how the TCP layers relate to the OSI model.	x	x	x			x		x	
IT.21.5.3	Demonstrate knowledge of the TCP and IP delivery service.	x	x	x			x		x	
IT.21.5.4	Identify TCP/IP applications and services (e.g., rlogin, SMTP, telnet, FTP, Domain, NFS).	x	x	x			x		x	
IT.21.5.5	Demonstrate knowledge of TCP/IP protocol details (e.g., Internet addresses, dotted decimal notation, ARP, RARP, IP datagram format, routing IP datagrams, TCP segment format).	x	x	x			x		x	
IT.21.5.6	Identify the services provided by the major TCP/IP applications.	x	x	x			x		x	
	Standard 21.6: *Demonstrate knowledge of basic communication protocols.*									
IT.21.6.1	Demonstrate knowledge of ARPANET, MILNET and NSFnet and their relationship to the Internet.	x	x	x			x		x	
IT.21.6.2	Demonstrate knowledge of how names and addresses are determined for LANs.	x	x	x			x		x	
IT.21.6.3	Identify components of a Class B Internet address in dotted decimal form.	x	x	x			x		x	
IT.21.6.4	Demonstrate knowledge of the form of a hierarchical Internet name.	x	x	x			x		x	
IT.21.6.5	Differentiate between an ordinary and gateway node.	x	x	x			x		x	
IT.21.6.6	Demonstrate knowledge of the IPX/SPX protocol and how it works together with TCP/IP.	x	x	x			x		x	
IT.21.6.7	Identify the basics of the ARP/RARP protocol.	x	x	x			x		x	
IT.21.6.8	Identify the contents of the Address Resolution Protocol (ARP) cache.	x	x	x			x		x	
IT.21.6.9	Identify the basics of the DNS, HTTP, telnet, and FTP protocols.	x	x	x			x		x	
IT.21.6.10	Identify the basics of the Simple Network Management Protocol (SNMP).	x	x	x			x		x	
IT.21.6.11	Compare/contrast SNMP functions to the OSI model.	x	x	x			x		x	
IT.21.6.12	Identify the basics of the PAP and CHAP protocols.	x	x	x			x		x	
IT.21.6.13	Identify the basics of MAC layer protocols.	x	x	x			x		x	
IT.21.6.14	Identify the levels at which networking can occur.	x	x	x			x		x	
IT.21.6.15	Differentiate between architectures (e.g., ISO, SNA, DNA).	x	x	x			x		x	
	Standard 21.7: *Install basic system architectures using current Windows operating system software.*									
IT.21.7.1	Configure a client desktop for network communications in Windows.	x	x	x	x	x	x	x	x	x
IT.21.7.2	Share files between two computers on a network using Windows.	x	x	x	x	x	x	x	x	x
IT.21.7.3	Design a system to direct cable-connect two computers using Windows.	x	x	x	x	x	x	x	x	x
IT.21.7.4	Expand PC memory.	x	x	x					x	

	Network Operating Systems									
	INSPIRE>IndianaLinks>Business>Inside Indiana Business									
	Standard 22.1: *Demonstrate knowledge of the general characteristics of network operating systems.*									
IT.22.1.1	Identify the purposes of a network operating system (NOS).	x	x	x	x				x	
IT.22.1.2	Differentiate between network operating systems and data distribution systems.	x	x	x	x				x	
IT.22.1.3	Identify how the four components of a network operating system (i.e., server platform, network services software, network redirection software, communications software) support network operations.	x	x	x	x				x	
IT.22.1.4	Define the criteria used to evaluate network operating systems.	x	x	x	x				x	
IT.22.1.5	Identify how protocols are supported.	x	x	x	x				x	
IT.22.1.6	Identify licensing requirements.	x	x	x	x				x	
IT.22.1.7	Demonstrate knowledge of the characteristics of the client/server models.	x	x	x	x				x	
IT.22.1.8	Analyze the advantages and disadvantages of the client/server model.	x	x	x	x				x	
IT.22.1.9	Demonstrate knowledge of a typical program function call.	x	x	x	x				x	
IT.22.1.10	Identify the properties of open systems.	x	x	x	x				x	
IT.22.1.11	Demonstrate knowledge of LAN connectivity issues.	x	x	x	x				x	
	Standard 22.2: *Demonstrate knowledge of network operating systems (i.e., Novell NetWare, Windows NT, LINUX, UNIX* , IBM Network, AppleTalk).									
IT.22.2.1	Identify network architecture.	x	x	x						
IT.22.2.2	Differentiate between network systems and OSI.	x	x	x						
IT.22.2.3	Identify capabilities of network systems.	x	x	x						
IT.22.2.4	Demonstrate knowledge of network support systems.	x	x	x						
IT.22.2.5	Demonstrate knowledge of protocols.	x	x	x						
IT.22.2.6	Identify network models.	x	x	x						
IT.22.2.7	Identify unique network tools.	x	x	x						
IT.22.2.8	Demonstrate knowledge of network software.	x	x	x						
	Standard 22.3: *Install network system.*									
IT.22.3.1	Create domain trusts.	x	x	x	x	x	x	x	x	x
IT.22.3.2	Maintain domain controllers.	x	x	x	x	x	x	x	x	x
IT.22.3.3	Make policy changes.	x	x	x	x	x	x	x	x	x
IT.22.3.4	Employ policy templates.	x	x	x	x	x	x	x	x	x
IT.22.3.5	Create user accounts, groups, and login scripts.	x	x	x	x	x	x	x	x	x
IT.22.3.6	Control access to files and directories.	x	x	x	x	x	x	x	x	x
IT.22.3.7	Establish shared network resources.	x	x	x	x	x	x	x	x	x
IT.22.3.8	Configure network domain accounts and profiles.	x	x	x	x	x	x	x	x	x
IT.22.3.9	Implement system policies.	x	x	x	x	x	x	x	x	x
IT.22.3.10	Create roaming user profiles.	x	x	x	x	x	x	x	x	x
IT.22.3.11	Troubleshoot network performance.	x	x	x	x	x	x	x	x	x
	Wide-Area Networks									
	INSPIRE>Links>Business>IndustryLink									
	Standard 23.1: *Demonstrate knowledge of basic telecommunications and the interconnection of networks.*									
IT.23.1.1	Demonstrate knowledge of WAN technology (e.g., subrate facilities, dataphone, digital service, multiplexers, time division multiplexing, modems, RS-232).	x	x	x			x		x	x
IT.23.1.2	Demonstrate knowledge of the different types of WAN connections.	x	x	x			x		x	x
IT.23.1.3	Demonstrate knowledge of point-to-point (PPP) interconnection.	x	x	x			x		x	x
IT.23.1.4	Identify basic telecommunications services (e.g., satellite, circuit switching, packet switching, wireless).	x	x	x			x		x	x

IT.23.1.5	Differentiate between local exchange carriers (LECs) and interexchange carriers (IXCs or IECs).	x	x	x			x		x	x
IT.23.1.6	Define local access and transport areas (LATAs).	x	x	x			x		x	x
IT.23.1.7	Identify long-distance carriers and their services.	x	x	x			x		x	x
IT.23.1.8	Identify packet carriers and their services.	x	x	x			x		x	x
IT.23.1.9	Identify the role of telecommunications tariffs.	x	x	x			x		x	x
	Standard 23.2: *Assess user needs for a wide-area network (WAN).*									
IT.23.2.1	Determine availability from LAN to meet requirements of WAN.	x	x	x			x			
IT.23.2.2	Determine the speed needed between sites to access applications.	x	x	x			x			
IT.23.2.3	Determine the subsets needed on the WAN.	x	x	x			x			
IT.23.2.4	Evaluate transmission options.	x	x	x			x			
	Standard 23.3: *Design WAN systems.*									
IT.23.3.1	Demonstrate knowledge of electronic communication (e.g., LAN, Internets, remote database access, EDI).	x	x	x			x			
IT.23.3.2	Demonstrate knowledge of basic telephony (analog vs. digital signals).	x	x	x			x			
IT.23.3.3	Demonstrate knowledge of the conversion of analog speech to digital.	x	x	x			x			
IT.23.3.4	Investigate emerging technologies.	x	x	x			x			
IT.23.3.5	Relate voice, data concepts, and video to wide-area networks.	x	x	x			x			
IT.23.3.6	Select primary and backup data circuits.	x	x	x			x			
IT.23.3.7	Evaluate analog and digital transmission for cost, performance, and reliability.	x	x	x			x			
IT.23.3.8	Create firewalls between trusted network and WAN.	x	x	x	x	x	x	x	x	x
IT.23.3.9	Establish a Virtual Private Network (VPN) to form the infrastructure of the WAN.	x	x	x	x	x	x	x	x	x
IT.23.3.10	Determine routers needed to connect with LAN.	x	x	x			x		x	
IT.23.3.11	Interconnect LANs using WAN services.	x	x	x	x		x			
IT.23.3.12	Incorporate cost-savings approaches, including frame-relay ATM and voice/video/data compression.	x	x	x			x			
	Network Management									
	INSPIRE>Links>Business>International Business									
	Standard 24.1: *Demonstrate knowledge of network management activities and procedures.*									
IT.24.1.1	Demonstrate knowledge of the basic principles of network management.	x	x	x	x	x	x	x	x	x
IT.24.1.2	Identify network system bootstrapping/initial program load.	x	x	x						
IT.24.1.3	Identify system generation.	x	x	x						
IT.24.1.4	Identify server configuration.	x	x	x						
IT.24.1.5	Identify workstations.	x	x	x						
IT.24.1.6	Demonstrate knowledge of connectivity, protocol, and security issues.	x	x	x	x	x	x	x	x	x
IT.24.1.7	Determine file organization (e.g., by owners, users, and privileges).	x	x	x	x	x	x	x	x	x
IT.24.1.8	Establish common standards for setting up and naming files.	x	x	x	x				x	x
IT.24.1.9	Identify the criteria used to establish a hierarchical directory.	x	x	x	x	x	x	x	x	x
IT.24.1.10	Determine methods for increasing performance.	x	x	x	x	x	x	x	x	x
IT.24.1.11	Define the role of the network manager.	x	x	x	x	x	x	x	x	x
IT.24.1.12	Determine methods for segmenting and balancing the network load.	x	x	x	x		x		x	x
IT.24.1.13	Determine number of servers needed.	x	x	x			x		x	
IT.24.1.14	Identify potential channel and cable bottlenecks and methods for resolving them.	x	x	x			x			x
IT.24.1.15	Determine procedures for performance analysis, evaluation, and monitoring.	x	x	x			x		x	
IT.24.1.16	Determine procedures for network system optimization and tuning.	x	x	x			x		x	
IT.24.1.17	Determine procedures for adding or deleting users.	x	x	x			x	x	x	
	Standard 24.2: *Demonstrate knowledge of network applications.*									
IT.24.2.1	Demonstrate knowledge of how disk storage is shared across a network.	x	x	x					x	x

IT.24.2.2	Demonstrate knowledge of how processing power is shared across a network.	x	x	x	x	x	x	x	x	x
IT.24.2.3	Demonstrate knowledge of application-specific servers (e.g., database, print, communications, terminal, fax, security).	x	x	x					x	x
IT.24.2.4	Identify the advantages of sharing backup and management of PCs across a network.	x	x	x					x	x
IT.24.2.5	Identify software licensing requirements and categories.	x	x	x					x	x
	Standard 24.3: Solve network applications problems.									
IT.24.3.1	Identify potential hardware compatibility problems.	x	x	x			x			x
IT.24.3.2	Identify precautions included in programs used on networks (e.g., self-metering, security keys, required configuration settings).	x	x	x			x			x
IT.24.3.3	Identify network areas in which application problems could exist (e.g., memory allocation, file lock settings, resource availability).	x	x	x			x			x
IT.24.3.4	Troubleshoot software problems.	x	x	x	x	x	x	x	x	x
	Standard 24.4: *Perform network analysis, selection, and design.*									
IT.24.4.1	Gather data to identify customer requirements.	x	x	x	x	x	x	x	x	x
IT.24.4.2	Identify system and network requirements.	x	x	x	x	x	x	x	x	x
IT.24.4.3	Analyze requirements.	x	x	x	x	x	x	x	x	x
IT.24.4.4	Define scope of work to meet customer requirements.	x	x	x	x	x	x	x	x	x
IT.24.4.5	Develop functional requirements/specifications for high-level systems.	x	x	x	x	x	x	x	x	x
IT.24.4.6	Identify time, technology, and resource constraints.	x	x	x	x	x	x	x	x	x
IT.24.4.7	Identify physical requirements for system implementation.	x	x	x	x	x	x	x	x	x
IT.24.4.8	Analyze system interdependencies.	x	x	x	x	x	x	x	x	x
IT.24.4.9	Identify alternate solutions.	x	x	x	x	x	x	x	x	x
IT.24.4.10	Research product and vendor architecture and equipment specifications/limitations.	x	x	x	x	x	x	x	x	x
IT.24.4.11	Estimate impact of change request.	x	x	x	x	x	x	x	x	x
IT.24.4.12	Prepare cost/benefit/risk analysis.	x	x	x	x	x	x	x	x	x
IT.24.4.13	Perform human factors analysis.	x	x	x	x	x	x	x	x	x
IT.24.4.14	Participate in design reviews.	x	x	x	x	x	x	x	x	x
IT.24.4.15	Design prototype of system.	x	x	x	x	x	x	x	x	x
IT.24.4.16	Develop testing strategy.	x	x	x	x	x	x	x	x	x
IT.24.4.17	Prepare overall plan for integrating new processes, protocols, and equipment.	x	x	x	x	x	x	x	x	x
IT.24.4.18	Develop deployment strategies appropriate for situation.	x	x	x	x	x	x	x	x	x
IT.24.4.19	Analyze facilities' bandwidth requirements and capacity planning (power cable/wire conduit).	x	x	x	x	x	x	x	x	x
IT.24.4.20	Revise processes/structure based on testing and certification.	x	x	x	x	x	x	x	x	x
IT.24.4.21	Identify hardware/software selection criteria.	x	x	x	x	x	x	x	x	x
IT.24.4.22	Select a LAN/WAN technology that meets defined set of requirements.	x	x	x	x	x	x	x	x	x
	Standard 24.5: *Design network security systems.*									
IT.24.5.1	Identify need for data protection.	x	x	x	x	x	x	x	x	x
IT.24.5.2	Identify need for network security.	x	x	x	x	x	x	x	x	x
IT.24.5.3	Analyze network security issues.	x	x	x	x	x	x	x	x	x
IT.24.5.4	Identify security requirements.	x	x	x	x	x	x	x	x	x
IT.24.5.5	Analyze the advantages/disadvantages of firewall architectures.	x	x	x	x	x	x	x	x	x
IT.24.5.6	Select firewalls and firewall architectures (e.g., combined firewall routers, proxy server software solutions, dedicated software solutions, dedicated appliances).	x	x	x	x	x	x	x	x	x
IT.24.5.7	Identify specific access levels that need to be accommodated.	x	x	x	x	x	x	x	x	x
IT.24.5.8	Determine how to protect against spoofing.	x	x	x	x	x	x	x	x	x

IT.24.5.9	Devise account administration functions to support network security.	x	x	x	x	x	x	x	x	x
IT.24.5.10	Develop security plans.	x	x	x	x	x	x	x	x	x
IT.24.5.11	Match security system design to identified security requirements.	x	x	x	x	x	x	x	x	x
	Standard 24.6: *Perform network installation procedures.*									
IT.24.6.1	Access needed information using company and manufacturers' references (e.g., procedural manuals, documentation, standards, work flowcharts).	x	x	x	x	x	x	x	x	x
IT.24.6.2	Assess user needs to determine which network operating systems to use.	x	x	x	x	x	x	x	x	x
IT.24.6.3	Set up/configure workstation-network connections.	x	x	x	x	x	x	x	x	x
IT.24.6.4	Set up/configure network components (e.g., interface cards, printers, and CD-ROM devices).	x	x	x	x	x	x	x	x	x
IT.24.6.5	Install modem.	x	x	x	x	x	x	x	x	x
IT.24.6.6	Install multiplexer.	x	x	x	x	x	x	x	x	x
IT.24.6.7	Install LAN operating system.	x	x	x	x	x	x	x	x	x
IT.24.6.8	Configure file server in PC network.	x	x	x	x	x	x	x	x	x
IT.24.6.9	Construct network cables.	x	x	x	x	x	x	x	x	x
IT.24.6.10	Test network connectivity using a network analyzer.	x	x	x	x	x	x	x	x	x
IT.24.6.11	Install cabling.	x	x	x	x	x	x	x	x	x
IT.24.6.12	Install network.	x	x	x	x	x	x	x	x	x
	Standard 24.7: *Build Ethernet networks.*									
IT.24.7.1	Select an appropriate Ethernet technology from among those currently available.	x	x	x	x	x	x	x	x	x
IT.24.7.2	Test Ethernet adapters.	x	x	x	x	x	x	x	x	x
IT.24.7.3	Design a traditional ethernet network.	x	x	x	x	x	x	x	x	x
IT.24.7.4	Make/test cables.	x	x	x	x	x	x	x	x	x
IT.24.7.5	Analyze Ethernet protocols.	x	x	x	x	x	x	x	x	x
IT.24.7.6	Locate security leaks.	x	x	x	x	x	x	x	x	x
IT.24.7.7	Correct security leaks.	x	x	x	x	x	x	x	x	x
IT.24.7.8	Segment an existing network with bridges and switches.	x	x	x	x	x	x	x	x	x
IT.24.7.9	Employ switches for collapsed backbones and high-speed serve connections.	x	x	x	x	x	x	x	x	x
IT.24.7.10	Alleviate bottlenecks with mixed-speed switches.	x	x	x	x	x	x	x	x	x
IT.24.7.11	Examine cost and performance trade-offs.	x	x	x	x	x	x	x	x	x
IT.24.7.12	Install Ethernet network.	x	x	x	x	x	x	x	x	x
IT.24.7.13	Configure Ethernet network.	x	x	x	x	x	x	x	x	x
IT.24.7.14	Integrate Ethernet network with a WAN.	x	x	x	x	x	x	x	x	x
	Standard 24.8: *Perform network operation procedures.*									
IT.24.8.1	Determine the type of wiring needed for the physical connection of the network.	x	x	x	x	x	x	x	x	x
IT.24.8.2	Connect PCs to form a network.	x	x	x	x	x	x	x	x	x
IT.24.8.3	Connect PC to mini or mainframe.	x	x	x	x	x	x	x	x	x
IT.24.8.4	Link mixed vendors (e.g., PC to Mac).	x	x	x	x	x	x	x	x	x
IT.24.8.5	Interconnect computers via backbone network.	x	x	x	x	x	x	x	x	x
IT.24.8.6	Document LAN configuration.	x	x	x	x	x	x	x	x	x
IT.24.8.7	Identify how the network protocols work together.	x	x	x	x	x	x	x	x	x
IT.24.8.8	Determine compatibility of various networks.	x	x	x	x	x	x	x	x	x
IT.24.8.9	Set up/configure TCP/IP services on workstations and network servers.	x	x	x	x	x	x	x	x	x
IT.24.8.10	Implement print queue in a PC network.	x	x	x	x	x	x	x	x	x
IT.24.8.11	Program a client-server application.	x	x	x	x	x	x	x	x	x
IT.24.8.12	Build a synchronous transmission circuit using a modem.	x	x	x	x	x	x	x	x	x

IT.24.8.13	Perform file-to-file copy in a PC network.	x	x	x	x	x	x	x	x	x
IT.24.8.14	Install/configure file server in a PC network.	x	x	x	x	x	x	x	x	x
IT.24.8.15	Operate the system in a multi-user environment.	x	x	x	x	x	x	x	x	x
	Standard 24.9: Perform hardware and desktop support.									
IT.24.9.1	Redirect output to different printers.	x	x	x	x	x	x	x	x	x
IT.24.9.2	Define print devices and job configurations.	x	x	x	x	x	x	x	x	x
IT.24.9.3	Check physical and virtual connections.	x	x	x	x	x	x	x	x	x
IT.24.9.4	Display server information.	x	x	x	x	x	x	x	x	x
IT.24.9.5	Demonstrate disk control.	x	x	x	x	x	x	x	x	x
IT.24.9.6	Mount/dismount a CD-ROM.	x	x	x	x	x	x	x	x	x
IT.24.9.7	Automate the mounting of a CD-ROM.	x	x	x	x	x	x	x	x	x
IT.24.9.8	Develop login scripts using login script commands.	x	x	x	x	x	x	x	x	x
IT.24.9.9	Replace computer hardware.	x	x	x	x	x	x	x	x	x
IT.24.9.10	Set up system configuration.	x	x	x	x	x	x	x	x	x
IT.24.9.11	Start up/shut down system.	x	x	x	x	x	x	x	x	x
IT.24.9.12	Install software packages.	x	x	x	x	x	x	x	x	x
IT.24.9.13	Respond to system messages.	x	x	x	x	x	x	x	x	x
IT.24.9.14	Troubleshoot system.	x	x	x	x	x	x	x	x	x
IT.24.9.15	Run software applications.	x	x	x	x	x	x	x	x	x
IT.24.9.16	Perform system analysis.	x	x	x	x	x	x	x	x	x
IT.24.9.17	Perform preventive maintenance.	x	x	x	x	x	x	x	x	x
IT.24.9.18	Perform software license audits.	x	x	x	x	x	x	x	x	x
IT.24.9.19	Coordinate security procedures.	x	x	x	x	x	x	x	x	x
	Standard 24.10: *Perform network administration.*									
IT.24.10.1	Define the role of the LAN administrator.	x	x	x	x	x	x	x	x	x
IT.24.10.2	Check physical and virtual connections.	x	x	x	x	x	x	x	x	x
IT.24.10.3	Limit server access.	x	x	x	x	x	x	x	x	x
IT.24.10.4	Apply current LAN concepts and technology.	x	x	x	x	x	x	x	x	x
IT.24.10.5	Attach computers and peripherals to LAN.	x	x	x	x	x	x	x	x	x
IT.24.10.6	Install LAN manager software.	x	x	x	x	x	x	x	x	x
IT.24.10.7	Perform administration functions using LAN manager software.	x	x	x	x	x	x	x	x	x
IT.24.10.8	Perform bandwidth optimization.	x	x	x	x	x	x	x	x	x
IT.24.10.9	Respond to system messages.	x	x	x	x	x	x	x	x	x
IT.24.10.10	Troubleshoot system.	x	x	x	x	x	x	x	x	x
IT.24.10.11	Run software applications.	x	x	x	x	x	x	x	x	x
IT.24.10.12	Perform system analysis.	x	x	x	x	x	x	x	x	x
IT.24.10.13	Perform preventive maintenance.	x	x	x	x	x	x	x	x	x
IT.24.10.14	Perform resource management.	x	x	x	x	x	x	x	x	x
IT.24.10.15	Analyze network operations.	x	x	x	x	x	x	x	x	x
IT.24.10.16	Modify network.	x	x	x	x	x	x	x	x	x
IT.24.10.17	Apply established network standards.	x	x	x	x	x	x	x	x	x
IT.24.10.18	Apply standard network address protocols.	x	x	x	x	x	x	x	x	x
IT.24.10.19	Monitor network activity/performance.	x	x	x	x	x	x	x	x	x
IT.24.10.20	Perform trend analyses.	x	x	x	x	x	x	x	x	x
IT.24.10.21	Perform functional verifications, audits, and monitoring.	x	x	x	x	x	x	x	x	x

IT.24.10.22	Coordinate security procedures.	x	x	x	x	x	x	x	x	x
IT.24.10.23	Document actions taken.	x	x	x	x	x	x	x	x	x
IT.24.10.24	Produce reports concerning system conditions.	x	x	x	x	x	x	x	x	x
IT.24.10.25	Document procedures for backups, virus prevention, and software distribution.	x	x	x	x	x	x	x	x	x
IT.24.10.26	Identify new ways of monitoring performance.	x	x	x	x	x	x	x	x	x
IT.24.10.27	Perform capacity and resource planning.	x	x	x	x	x	x	x	x	x
	Standard 24.11: *Perform network maintenance and diagnostics and testing.*									
IT.24.11.1	Execute network diagnostics program for software.	x	x	x	x	x	x	x	x	x
IT.24.11.2	Execute network diagnostics program for hardware.	x	x	x	x	x	x	x	x	x
IT.24.11.3	Apply standard and protocols.	x	x	x	x	x	x	x	x	x
IT.24.11.4	Document actions taken (maintenance log).	x	x	x	x	x	x	x	x	x
IT.24.11.5	Establish a preventive maintenance schedule.	x	x	x	x	x	x	x	x	x
IT.24.11.6	Perform preventive maintenance.	x	x	x	x	x	x	x	x	x
IT.24.11.7	Respond to system messages.	x	x	x	x	x	x	x	x	x
IT.24.11.8	Troubleshoot system.	x	x	x	x	x	x	x	x	x
IT.24.11.9	Restore LAN operating systems.	x	x	x	x	x	x	x	x	x
IT.24.11.10	Replace LAN hardware components.	x	x	x	x	x	x	x	x	x
IT.24.11.11	Define the scope and applicability of the test.	x	x	x	x	x	x	x	x	x
IT.24.11.12	Develop a test plan.	x	x	x	x	x	x	x	x	x
IT.24.11.13	Identify needed resources.	x	x	x	x	x	x	x	x	x
IT.24.11.14	Obtain needed resources.	x	x	x	x	x	x	x	x	x
IT.24.11.15	Assess network impact.	x	x	x	x	x	x	x	x	x
IT.24.11.16	Set up test environment.	x	x	x	x	x	x	x	x	x
IT.24.11.17	Set up testing schedule.	x	x	x	x	x	x	x	x	x
IT.24.11.18	Execute testing in accordance with established plans and schedule.	x	x	x	x	x	x	x	x	x
IT.24.11.19	Document errors reported/tracked.	x	x	x	x	x	x	x	x	x
IT.24.11.20	Interpret test results.	x	x	x	x	x	x	x	x	x
IT.24.11.21	Report test results.	x	x	x	x	x	x	x	x	x
IT.24.11.22	Perform system integration testing and volume/performance testing.	x	x	x	x	x	x	x	x	x
IT.24.11.23	Demonstrate knowledge of user acceptance testing.	x	x	x	x	x	x	x	x	x
	Standard 24.12: *Explain disaster recovery and business continuance.*									
IT.24.12.1	Differentiate between disaster recovery and business resumption.	x	x	x	x	x	x	x	x	x
IT.24.12.2	Identify the steps in a disaster recovery plan.	x	x	x	x	x	x	x	x	x
IT.24.12.3	Identify the steps in a business resumption plan.	x	x	x	x	x	x	x	x	x
IT.24.12.4	Identify methods for avoiding common computer system disasters (e.g., UPS, RAID).	x	x	x	x	x	x	x	x	x
IT.24.12.5	Identify common backup devices.	x	x	x	x	x	x	x	x	x
IT.24.12.6	Identify the criteria for selecting a backup system (e.g., tape).	x	x	x	x	x	x	x	x	x
IT.24.12.7	Compare/contrast streaming and file-by-file backup systems.	x	x	x	x	x	x	x	x	x
IT.24.12.8	Establish process for archiving files.	x	x	x	x	x	x	x	x	
IT.24.12.9	Develop a disaster recovery plan.	x	x	x	x	x	x	x	x	x
IT.24.12.10	Develop a business resumption plan.	x	x	x	x	x	x	x	x	x
IT.24.12.11	Back up system.	x	x	x	x	x	x	x	x	x
IT.24.12.12	Restore system.	x	x	x	x	x	x	x	x	x

	Database Management System Basics.									
	INSPIRE>Indiana Links>Business>Indiana Business Magazine									
	Standard 25.1: *Demonstrate knowledge of Database Management System (DBMS) basics.*									
IT.25.1.1	Interpret terminology associated with relational databases.	x	x	x					x	
IT.25.1.2	Demonstrate knowledge of the features, functions, and architecture of a DBMS.	x	x	x					x	
IT.25.1.3	Trace the evolution of DBMS models and their implementation.	x	x	x				x	x	
IT.25.1.4	Identify the uses of a DBMS in business organizations.	x	x	x				x	x	x
IT.25.1.5	Demonstrate knowledge of the concepts necessary to access organizational databases.	x	x	x						
IT.25.1.6	Analyze the organization of data in a DBMS.	x	x	x			x			
IT.25.1.7	Identify the impact of networks on DBMS.	x	x	x					x	
IT.25.1.8	Demonstrate knowledge of how a DBMS ensures data integrity through transaction-control techniques.	x	x	x			x			
	Standard 25.2: *Employ computational and logical operators.*									
IT.25.2.1	Create programs using basic arithmetic operators.	x	x	x			x			
IT.25.2.2	Develop programs using various relational operators and compound conditions.	x	x	x			x			
IT.25.2.3	Develop a data model for computation.	x	x	x			x			
	Standard 25.3: *Develop report-preparation programs.*									
IT.25.3.1	Create database objects.	x	x	x	x	x	x	x	x	x
IT.25.3.2	Produce formatted reports.	x	x	x	x	x	x	x	x	x
IT.25.3.3	Produce single- and multiple-level control break reports and subtotal and final totals.	x	x	x	x	x	x	x	x	x
	Standard 25.4: *Develop database programs.*									
IT.25.4.1	Write programs that allow the user to make a menu choice to carry out an appropriate action.	x	x	x	x	x	x	x	x	x
IT.25.4.2	Write programs that require statements to be executed multiple times by using structured programming.	x	x	x	x	x	x	x	x	x
IT.25.4.3	Write programs that access multiple files.	x	x	x	x	x	x	x	x	x
IT.25.4.4	Design an information system within a database environment.	x	x	x	x	x	x	x	x	x
	Standard 25.5: *Employ a DBMS.*									
IT.25.5.1	Build database applications.	x	x	x	x	x	x	x	x	x
IT.25.5.2	Distribute data across a distributed DBMS.	x	x	x	x	x	x	x	x	x
IT.25.5.3	Analyze/model organizations using Entity-Relationship and Object technologies.	x	x	x	x	x	x	x	x	x
IT.25.5.4	Remove data anomalies through the process of normalization.	x	x	x	x	x	x	x	x	x
IT.25.5.5	Create/update a relational database using Structured Query Language.	x	x	x	x	x	x	x	x	x
IT.25.5.6	Query a relational database using Structured Query Language.	x	x	x	x	x	x	x	x	x
IT.25.5.7	Query data from an organizational repository using a database access facility.	x	x	x	x	x	x	x	x	x
	Database Administration									
	INSPIRE>EBSCO Host>Business Source									
	Standard 26.1: *Apply databases to actual situations and business problems.*									
IT.26.1.1	Derive database design from a workflow drawing or other requirement documents.	x	x	x	x	x	x	x	x	x
IT.26.1.2	Design a database to solve a business problem or other real-life problem situation.	x	x	x	x	x	x	x	x	x
IT.26.1.3	Identify the relationship among database components.	x	x	x	x	x	x	x	x	x
IT.26.1.4	Sort data on multiple fields.	x	x	x	x	x	x	x	x	x
IT.26.1.5	Add/remove filters.	x	x	x	x	x	x	x	x	x
IT.26.1.6	Create queries with multiple criteria.	x	x	x	x	x	x	x	x	x
IT.26.1.7	Create/apply different types of queries.	x	x	x	x	x	x	x	x	x
IT.26.1.8	Join tables in a query.	x	x	x	x	x	x	x	x	x
IT.26.1.9	Enhance the design of a form.	x	x	x	x	x	x	x	x	x
IT.26.1.10	Create needed subforms.	x	x	x	x	x	x	x	x	x

IT.26.1.11	Group data in reports.	x	x	x	x	x	x	x	x	x
IT.26.1.12	Make a calculation on a report.	x	x	x	x	x	x	x	x	x
IT.26.1.13	Imbed data and graphics.	x	x	x	x	x	x	x	x	x
IT.26.1.14	Import data and graphics.	x	x	x	x	x	x	x	x	x
IT.26.1.15	Link data and graphics.	x	x	x	x	x	x	x	x	x
	Standard 26.2: *Apply* data modeling techniques.									
IT.26.2.1	Interpret terminology associated with data models.	x	x	x	x	x	x	x	x	x
IT.26.2.2	Compare/contrast various data models.	x	x	x	x	x	x	x	x	x
IT.26.2.3	Analyze data models.	x	x	x	x	x	x	x	x	x
IT.26.2.4	Develop a data model to describe an application's data.	x	x	x	x	x	x	x	x	x
	Standard 26.3: *Create conceptual data models.*									
IT.26.3.1	Analyze model requirements.	x	x	x	x	x	x	x	x	x
IT.26.3.2	Identify business entities and the relationships between them.	x	x	x	x	x	x	x	x	x
IT.26.3.3	Define data in an integrated data dictionary.	x	x	x	x	x	x	x	x	x
IT.26.3.4	Ensure that conceptual model includes tools to facilitate user access.	x	x	x	x	x	x	x	x	x
	Standard 26.4: *Validate conceptual data models.*									
IT.26.4.1	Present conceptual data model to client.	x	x	x	x	x	x	x	x	x
IT.26.4.2	Resolve issues with client.	x	x	x	x	x	x	x	x	x
IT.26.4.3	Secure client approval for model.	x	x	x	x	x	x	x	x	x
IT.26.4.4	Feed recommendations back into the modeling process.	x	x	x	x	x	x	x	x	x
IT.26.4.5	Document validation process.	x	x	x	x	x	x	x	x	x
	Standard 26.5: Integr*ate* conceptual data models with enterprise models.									
IT.26.5.1	Ensure that conceptual data model is consistent with enterprise model (e.g., entity names, relationships, and definitions).	x	x	x	x	x	x	x	x	x
IT.26.5.2	Develop conceptual schema.	x	x	x	x	x	x	x	x	x
IT.26.5.3	Secure client approval for modifications in enterprise models.	x	x	x	x	x	x	x	x	x
	Standard 26.6: *Reconcile conceptual models with appropriate-level process models.*									
IT.26.6.1	Verify consistencies between models.	x	x	x	x	x	x	x	x	x
IT.26.6.2	Identify areas of overlap.	x	x	x	x	x	x	x	x	x
IT.26.6.3	Verify that data entities in process model have a corresponding entity data model.	x	x	x	x	x	x	x	x	x
IT.26.6.4	Document changes or modifications in either model.	x	x	x	x	x	x	x	x	x
	Standard 26.7: *Create logical data models.*									
IT.26.7.1	Map data model to a relational model.	x	x	x	x	x	x	x	x	x
IT.26.7.2	Identify attributes of model entities and relationships between them.	x	x	x	x	x	x	x	x	x
IT.26.7.3	Verify that logical model is consistent with conceptual model.	x	x	x	x	x	x	x	x	x
IT.26.7.4	Specify integrity constraints.	x	x	x	x	x	x	x	x	x
	Standard 26.8: *Distinguish unique identifiers.*									
IT.26.8.1	Document identifiers.	x	x	x						
IT.26.8.2	Identify rationale for selection of identifiers.	x	x	x			x			
IT.26.8.3	Validate identifiers with client.	x	x	x						x
	Standard 26.9: *Normalize data models.*									
IT.26.9.1	Normalize logical data model in accordance with established company policy.	x	x	x			x			x
IT.26.9.2	Verify that data model matches specifications.	x	x	x			x			
IT.26.9.3	Validate logical data model with client.	x	x	x	x	x	x	x	x	x

	Standard 26.10: *Reconcile conceptual models with lower process models.*									
IT.26.10.1	Verify consistencies between models.	x	x	x						
IT.26.10.2	Identify areas of overlap.	x	x	x						
IT.26.10.3	Verify that data entities in process model have a corresponding entity data model.	x	x	x						
IT.26.10.4	Document changes or modifications in either model.	x	x	x			x			
IT.26.10.5	Integrate logical data model with enterprise model.	x	x	x			x			
	Standard 26.11: *Determine environment/platform for physical data models.*									
IT.26.11.1	Research potential computer environments/platforms.	x	x	x			x			x
IT.26.11.2	Identify platform capabilities and limitations.	x	x	x			x			x
IT.26.11.3	Select environment/platform based on technical, business, and skill information gathered.	x	x	x			x			x
IT.26.11.4	Secure approval of target environment/platform.	x	x	x			x			x
	Standard 26.12: *Identify backup and recovery requirements for physical models.*									
IT.26.12.1	Establish backup requirements consistent with corporate policy and business needs.	x	x	x	x	x	x	x	x	x
IT.26.12.2	Document established backup procedures.	x	x	x	x	x	x	x	x	x
IT.26.12.3	Control access to database to maintain security.	x	x	x	x	x	x	x	x	x
	Standard 26.13: *Identify model access requirements* .									
IT.26.13.1	Identify inputs, output, and volume of every user view.	x	x	x			x			x
IT.26.13.2	Categorize user views by type of transaction.	x	x	x			x			x
IT.26.13.3	Document access to data by type of access.	x	x	x			x			x
IT.26.13.4	Integrate access requirements with backup and recovery plan.	x	x	x			x			x
	Standard 26.14: *Identify physical database characteristics.*									
IT.26.14.1	Identify name, type, and length of attributes.	x	x	x						
IT.26.14.2	Employ table and file names that conform to naming conventions.	x	x	x						
IT.26.14.3	Group/assign tables to disk files.	x	x	x						
IT.26.14.4	Index files for performance and integrity.	x	x	x						
IT.26.14.5	Verify that data types are consistent between attributes.	x	x	x						
IT.26.14.6	Employ normalization and modeling as cross-checking techniques.	x	x	x						
	Standard 26.15: *Reconcile physical design with processing requirements.*									
IT.26.15.1	Resolve conflicts between physical model and process model.	x	x	x						
IT.26.15.2	Verify that data entities in process model have a corresponding entity data model.	x	x	x						
IT.26.15.3	Document changes made to either model.	x	x	x	x	x	x	x	x	x
	Data Warehousing									
	INSPIRE>EBSCO Host>Academic Search									
	Standard 27.1: *Demonstrate knowledge of basic data warehousing concepts.*									
IT.27.1.1	Differentiate between traditional databases and data warehouses.	x	x	x						
IT.27.1.2	Recognize importance of data warehouses and integration.	x	x	x						
IT.27.1.3	Recognize that information is a competitive resource.	x	x	x						
IT.27.1.4	Identify components of data warehouses (e.g., subject-oriented, integrated, time-variant, nonvolatile).	x	x	x						
IT.27.1.5	Identify the characteristics and uses of metadata.	x	x	x						
IT.27.1.6	Define types of information (e.g., associations, sequences, classifications, clusters, and forecasting).	x	x	x						
IT.27.1.7	Demonstrate knowledge of data conversion techniques and functions.	x	x	x						
IT.27.1.8	Identify types of programs and applications for data warehousing.	x	x	x						
IT.27.1.9	Identify types of data mining tools (i.e., neural networks, decision trees, rule induction, and data visualization).	x	x	x						
IT.27.1.10	Define public summary data.	x	x	x						
IT.27.1.11	Demonstrate knowledge of ethical issues of data warehousing.	x	x	x	x	x	x	x	x	x

	Standard 27.2: *Apply ethical behaviors to data warehousing.*									
IT.27.2.1	Define appropriate security measures.	x	x	x	x	x	x	x	x	x
IT.27.2.2	Analyze the limitations of external data.	x	x	x	x	x	x	x	x	x
IT.27.2.3	Identify ethical uses of data.	x	x	x	x	x	x	x	x	x
IT.27.2.4	Define use of permanent detail data for legal or ethical purposes.	x	x	x	x	x	x	x	x	x
	Standard 27.3: *Perform data entry and updating.*									
IT.27.3.1	Develop an entity-relationship diagram.	x	x	x			x			
IT.27.3.2	Employ appropriate index or indices.	x	x	x						
IT.27.3.3	Define data repositories.	x	x	x						
IT.27.3.4	Design metamodel.	x	x	x	x	x	x	x	x	x
IT.27.3.5	Apply appropriate security measures.	x	x	x	x	x	x	x	x	x
IT.27.3.6	Differentiate between permanent detail data and regular data.	x	x	x						
IT.27.3.7	Apply skill in working with data programs.	x	x	x			x			
IT.27.3.8	Maintain metadata.	x	x	x						
IT.27.3.9	Size data warehouse.	x	x	x						
IT.27.3.10	Load/transfer data (map data).	x	x	x						
IT.27.3.11	Scrub/filter data.	x	x	x						
	Standard 27.4: *Perform data retrieval.*									
T.27.4.1	Locate appropriate data warehouses.	x	x	x						x
IT.27.4.2	Perform strategic analyses using a multidimensional database.	x	x	x						x
IT.27.4.3	Secure necessary indices.	x	x	x						x
IT.27.4.4	Design reasonable query.	x	x	x	x	x	x	x	x	x
IT.27.4.5	Define nature of application.	x	x	x						
IT.27.4.6	Apply appropriate security measures.	x	x	x	x	x	x	x	x	x
IT.27.4.7	Obtain necessary responses from data query.	x	x	x			x			
IT.27.4.8	Calculate derived and aggregate data.	x	x	x			x			
IT.27.4.9	Validate the processing of data.	x	x	x			x			
	Standard 27.5: *Apply data.*									
IT.27.5.1	Optimize query procedures.	x	x	x			x			
IT.27.5.2	Evaluate information gathered in query.	x	x	x			x			
IT.27.5.3	Utilize public summary data.	x	x	x			x			
IT.27.5.4	Design reporting medium.	x	x	x	x	x	x	x	x	x
IT.27.5.5	Perform online analytical processing.	x	x	x						
IT.27.5.6	Construct report from data gathered.	x	x	x	x	x	x	x	x	x
	Application Development Life Cycle									
	INSPIRE>EBSCO Host>Regional Business News									
	Standard 28.1: *Conduct needs analysis.*									
IT.28.1.1	Define business problem to be solved by the application (e.g., through interview process).	x	x	x	x	x	x	x	x	x
IT.28.1.2	Identify scope of project.	x	x	x	x	x	x	x	x	x
IT.28.1.3	Access needed information using company procedural manuals, references, documentation, and standards.	x	x	x	x	x	x	x	x	x
IT.28.1.4	Define business information requirements.	x	x	x	x	x	x	x	x	x
IT.28.1.5	Align information system (IS) design with the business process.	x	x	x	x	x	x	x	x	x
IT.28.1.6	Determine hardware and software needs.	x	x	x	x	x	x	x	x	x
IT.28.1.7	Interpret source data, charts, and graphs.	x	x	x	x	x	x	x	x	x
IT.28.1.8	Review organizational structure.	x	x	x	x	x	x	x	x	x

IT.28.1.9	Interpret existing operating documents and procedures for the system.	x	x	x	x	x	x	x	x	x
IT.28.1.10	Observe existing procedures.	x	x	x	x	x	x	x	x	x
IT.28.1.11	Document existing procedures.	x	x	x	x	x	x	x	x	x
IT.28.1.12	Document possible alternative solutions.	x	x	x	x	x	x	x	x	x
IT.28.1.13	Identify processing requirements.	x	x	x	x	x	x	x	x	x
IT.28.1.14	Define variables.	x	x	x	x	x	x	x	x	x
IT.28.1.15	Analyze specifications.	x	x	x	x	x	x	x	x	x
IT.28.1.16	Present findings and recommendations to users and management (e.g., work plan, project estimate).	x	x	x	x	x	x	x	x	x
	Standard 28.2: *Design computer applications.*									
IT.28.2.1	Establish standards and policies to govern the development of organizational information systems.	x	x	x	x	x	x	x	x	x
IT.28.2.2	Consider the benefits of using a cross-functional team in policy and procedure development.	x	x	x	x	x	x	x	x	x
IT.28.2.3	Identify development team.	x	x	x	x	x	x	x	x	x
IT.28.2.4	Develop team mission statement aligned with organizational mission.	x	x	x	x	x	x	x	x	x
IT.28.2.5	Determine the roles of user and management in the computer system development process.	x	x	x	x	x	x	x	x	x
IT.28.2.6	Outline steps for program development cycle, (e.g., prototyping, storyboarding).	x	x	x	x	x	x	x	x	x
IT.28.2.7	Identify processing requirements.	x	x	x	x	x	x	x	x	x
IT.28.2.8	Create specs with development team.	x	x	x	x	x	x	x	x	x
IT.28.2.9	Divide design specifications into logical blocks (e.g., flowchart, dataflow diagram, system flow record and layout).	x	x	x	x	x	x	x	x	x
IT.28.2.10	Identify constraints (e.g., political, financial, time, hardware, and systems).	x	x	x			x			
IT.28.2.11	Select programming language/SOFTWARE.	x	x	x			x			
IT.28.2.12	Select hardware platform.	x	x	x			x			
IT.28.2.13	Establish input and output (I/O) requirements.	x	x	x						x
IT.28.2.14	Design system input/output processes.	x	x	x	x	x	x	x	x	x
IT.28.2.15	Prepare logic using program flowchart.	x	x	x	x	x	x	x	x	x
IT.28.2.16	Differentiate between system documentation and user documentation.	x	x	x						
IT.28.2.17	Employ top-down design and structured programming.	x	x	x						
IT.28.2.18	Define arrays and tables.	x	x	x						
IT.28.2.19	Determine compilers to be used in design.	x	x	x						
IT.28.2.20	Determine iteration (looping) to be used.	x	x	x						
IT.28.2.21	Apply rules for naming variables.	x	x	x						
IT.28.2.22	Apply normalization rules to data attributes.	x	x	x						
IT.28.2.23	Define test data to be developed.	x	x	x						
IT.28.2.24	Employ normalization and modeling as cross-checking techniques.	x	x	x						
IT.28.2.25	Maintain project scope.	x	x	x						
IT.28.2.26	Create design documentation.	x	x	x	x	x	x	x	x	x
IT.28.2.27	Present system design.	x	x	x	x	x	x	x	x	x
	Standard 28.3: *Develop computer programs in accordance with programming theory.*									
IT.28.3.1	Apply established operating system development tools, commands, utilities, and standards.	x	x	x						
IT.28.3.2	Evaluate operating system constraints.	x	x	x						
IT.28.3.3	Develop programs using file-handling techniques.	x	x	x						
IT.28.3.4	Develop intuitive user interfaces.	x	x	x			x			x
IT.28.3.5	Develop programs using data-validation techniques.	x	x	x						
IT.28.3.6	Develop interactive processes.	x	x	x						
IT.28.3.7	Develop menu-driven programs.	x	x	x						
IT.28.3.8	Develop database programs.	x	x	x						

IT.28.3.9	Develop programs that utilize a recursive process.	x	x	x						
IT.28.3.10	Develop programs using libraries.	x	x	x						
IT.28.3.11	Develop programs using system calls.	x	x	x						
IT.28.3.12	Develop programs using design tool.	x	x	x						
IT.28.3.13	Develop programs using arrays, both one- and two-dimensional.	x	x	x						
IT.28.3.14	Write source code per standards.	x	x	x						
IT.28.3.15	Plan program output using a spacing chart.	x	x	x						
IT.28.3.16	Code a modular program.	x	x	x						
IT.28.3.17	Interpret a simple hierarchy chart.	x	x	x						
IT.28.3.18	Interpret a simple pseudocode design.	x	x	x						
IT.28.3.19	Perform program sorts.	x	x	x						
IT.28.3.20	Design a decision table for a specified problem.	x	x	x						
IT.28.3.21	Employ loops.	x	x	x						
IT.28.3.22	Apply logical operators (e.g., AND, OR, NOT).	x	x	x						
IT.28.3.23	Code error-handling techniques.	x	x	x						
IT.28.3.24	Employ data files.	x	x	x						
IT.28.3.25	Comply with commenting and internal documentation standards.	x	x	x						
IT.28.3.26	Perform character manipulation.	x	x	x						
IT.28.3.27	Declare/initialize variables.	x	x	x						
IT.28.3.28	Modify variables.	x	x	x						
IT.28.3.29	Evaluate series of logical expressions.	x	x	x						
IT.28.3.30	Code separate addition, subtraction, multiplication, and division statements.	x	x	x						
IT.28.3.31	Initialize arrays.	x	x	x						
IT.28.3.32	Generate executable code.	x	x	x						
IT.28.3.33	Employ functions (e.g., library, user-defined, sting).	x	x	x						
IT.28.3.34	Write arithmetic statements.	x	x	x						
IT.28.3.35	Write I/O statements.	x	x	x						
IT.28.3.36	Write internal documentation.	x	x	x						
IT.28.3.37	Write subroutines.	x	x	x						
IT.28.3.38	Employ conditional statements.	x	x	x						
	Standard 28.4: *Test programs.*									
IT.28.4.1	Perform debugging functions.	x	x	x						
IT.28.4.2	Debug syntax errors.	x	x	x						
IT.28.4.3	Create test data and plan for checking logic and error routines.	x	x	x			x			
IT.28.4.4	Execute program with test data.	x	x	x						
IT.28.4.5	Correct execution errors.	x	x	x						
IT.28.4.6	Perform unit and integration tests.	x	x	x						
IT.28.4.7	Analyze test results.	x	x	x			x			
IT.28.4.8	Correct logic errors.	x	x	x						
IT.28.4.9	Perform usability tests.	x	x	x						x
	Standard 28.5: Develop documentation.									
IT.28.5.1	Identify documentation needs.	x	x	x						x
IT.28.5.2	Prepare program documentation.	x	x	x						
IT.28.5.3	Prepare user documentation.	x	x	x						x
IT.28.5.4	Prepare dataflow diagrams.	x	x	x						

IT.28.5.5	Update design documentation.	x	x	x			x			
IT.28.5.6	Establish documentation-update method.	x	x	x						x
	Standard 28.6: Evaluate system.									
IT.28.6.1	Identify evaluation criteria.	x	x	x						x
IT.28.6.2	Develop test plan.	x	x	x			x			
IT.28.6.3	Conduct tests.	x	x	x					x	
IT.28.6.4	Analyze test data.	x	x	x			x		x	
IT.28.6.5	Present test results.	x	x	x	x	x	x	x	x	x
	Standard 28.7: *Install computer application system.*									
IT.28.7.1	Review organizational structure.	x	x	x						
IT.28.7.2	Interpret existing operating documents and procedures for the system.	x	x	x						
IT.28.7.3	Design implementation plan.	x	x	x	x	x	x	x	x	x
IT.28.7.4	Present implementation plan to users and management.	x	x	x	x	x	x	x	x	x
IT.28.7.5	Perform implementation or changeover to new system.	x	x	x	x	x	x	x	x	x
IT.28.7.6	Perform post-implementation evaluation of new system.	x	x	x	x	x	x	x	x	x
IT.28.7.7	Correct deficiencies.	x	x	x	x	x	x	x	x	x
IT.28.7.8	Train personnel.	x	x	x	x	x	x	x	x	x
IT.28.7.9	Identify ongoing support requirements.	x	x	x	x	x	x	x	x	x
	Standard 28.8: *Measure quality assurance* .									
IT.28.8.1	Identify metrics for measurement.	x	x	x	x	x	x	x	x	x
IT.28.8.2	Establish baseline performance.	x	x	x	x	x	x	x	x	x
IT.28.8.3	Measure actual performance and baseline performance.	x	x	x	x	x	x	x	x	x
	Information Systems (IS) Theory									
	INSPIRE>Links>Business>International Business									
	Standard 29.1: Demonst*rate* a basic knowledge of systems theory and quality concepts.									
IT.29.1.1	Demonstrate knowledge of the underlying concepts of the information systems discipline.	x	x	x						
IT.29.1.2	Compare/contrast data, information, and knowledge.	x	x	x						
IT.29.1.3	Demonstrate knowledge of methods for achieving productivity in knowledge work.	x	x	x						
IT.29.1.4	Apply general systems theory to the analysis and development of an information system.	x	x	x						
IT.29.1.5	Identify the properties of open systems.	x	x	x						
IT.29.1.6	Define the relationship between system components.	x	x	x						
IT.29.1.7	Characterize the role of data representation, both non-numeric and numeric (e.g., integers, reals, errors).	x	x	x						
IT.29.1.8	Identify procedures for formal problem solving.	x	x	x						
IT.29.1.9	Demonstrate knowledge of the fundamental concept of information theory and organizational system processes.	x	x	x						
IT.29.1.10	Identify the essential properties of information systems.	x	x	x	x	x	x	x	x	x
IT.29.1.11	Differentiate between the role of information systems within a company and their role in a global environment.	x	x	x	x	x	x	x	x	x
	Standard 29.2: *Identify system infrastructure.*									
IT.29.2.1	Select a systems development model.	x	x	x						
IT.29.2.2	Demonstrate knowledge of the components of the system infrastructure (e.g., hardware, communications, database, site).	x	x	x						
IT.29.2.3	Identify the relationship of users and suppliers to the system.	x	x	x				x	x	x
IT.29.2.4	Identify the objectives of system.	x	x	x				x	x	x
IT.29.2.5	Identify the process for selecting software products and processes.	x	x	x				x	x	x
IT.29.2.6	Identify the development cycle.	x	x	x				x	x	x
IT.29.2.7	Outline the system controls.	x	x	x				x	x	x

	Standard 29.3: *Select systems development approach.*									
IT.29.3.1	Summarize application planning, development, and risk management for information system.	x	x	x						
IT.29.3.2	Identify potential problems in system implementation.	x	x	x			x			x
IT.29.3.3	Determine whether prototyping system is feasible.	x	x	x			x			
IT.29.3.4	Expand development plan using packages.	x	x	x			x			
IT.29.3.5	Develop a plan using data-oriented techniques.	x	x	x	x	x	x	x	x	x
IT.29.3.6	Employ object-oriented development techniques.	x	x	x						
IT.29.3.7	Employ process-oriented development techniques.	x	x	x						
IT.29.3.8	Evaluate systems engineering considerations.	x	x	x			x			
IT.29.3.9	Determine software design process, from specification to implementation.	x	x	x	x	x	x	x	x	x
IT.29.3.10	Appraise software process and product life-cycle models.	x	x	x			x			
IT.29.3.11	Assess software design methods and tools.	x	x	x			x			
	Standard 29.4: *Compare/contrast individual and collaborative knowledge work.*									
IT.29.4.1	Identify stakeholders in a given IS context.	x	x	x	x	x	x	x	x	x
IT.29.4.2	Identify desired group and team behavior in an IS context.	x	x	x	x	x	x	x	x	x
IT.29.4.3	Demonstrate knowledge of how to apply team methods to empower coworkers.	x	x	x	x	x	x	x	x	x
IT.29.4.4	Measure empowerment and effectiveness.	x	x	x	x	x	x	x	x	x
IT.29.4.5	Identify knowledge-building and knowledge-maintaining tasks.	x	x	x						
IT.29.4.6	Differentiate between individual and group technology.	x	x	x						
IT.29.4.7	Demonstrate knowledge of the characteristics and attributes of knowledge work for both individual and group technology.	x	x	x						
IT.29.4.8	Demonstrate knowledge of group support technology for common knowledge requirements.	x	x	x						
IT.29.4.9	Identify work modifications necessitated by working in groups (e.g., additional processing).	x	x	x			x			x
IT.29.4.10	Evaluate success of work.	x	x	x			x			
IT.29.4.11	Demonstrate knowledge of the information analysis process.	x	x	x						
IT.29.4.12	Demonstrate knowledge of information technology solutions.	x	x	x						
	Standard 29.5: *Plan strategies for implementing system.*									
IT.29.5.1	Identify data requirements through questioning of individuals and groups.	x	x	x			x			x
IT.29.5.2	Determine information requirements through analysis of individual and group tasks.	x	x	x			x			x
IT.29.5.3	Identify information technology requirements for given worksite.	x	x	x			x			x
IT.29.5.4	Identify computer hardware.	x	x	x						x
IT.29.5.5	Specify the data structures to be implemented.	x	x	x						x
IT.29.5.6	Select overall implementation strategy (e.g., top-down, bottom up; teams vs. individual).	x	x	x		x	x			x
IT.29.5.7	Analyze the interaction of the operating system and hardware architecture.	x	x	x			x			
IT.29.5.8	Determine the database management system to be implemented.	x	x	x			x			
IT.29.5.9	Establish ownership of data and system.	x	x	x						x
IT.29.5.10	Determine methods for providing computing support for the end user.	x	x	x			x		x	x
IT.29.5.11	Plan measures to ensure system integrity.	x	x	x			x	x	x	x
	Standard 29.6: *Facilitate measures of achievement.*									
IT.29.6.1	Evaluate potential systems solutions against criteria for success.	x	x	x			x			x
IT.29.6.2	Apply continuous improvement methodologies.	x	x	x			x		x	x
IT.29.6.3	Identify quality standards to be documented (e.g., ISO, Baldridge).	x	x	x			x			x
IT.29.6.4	Identify the competitive advantage achieved through IS.	x	x	x						
IT.29.6.5	Specify measurements to be taken.	x	x	x			x			
IT.29.6.6	Assign responsibility for documentation.	x	x	x				x	x	x

	Information Systems Management									
	INSPIRE>Links>Business>Business.com									
	Standard 30.1: *Conduct organizational planning for information systems.*									
IT.30.1.1	Demonstrate knowledge of the strategic role of information systems in organizations.	x	x	x						
IT.30.1.2	Demonstrate knowledge of data administration and access to corporate information resources.	x	x	x						
IT.30.1.3	Identify information technology needed to support given sets of tasks and activities for individuals, workgroups, and the organization.	x	x	x			x			x
IT.30.1.4	Align IS planning with enterprise planning.	x	x	x			x			x
IT.30.1.5	Define the strategic relationship of IS activities to enhancing competitive position.	x	x	x			x			x
IT.30.1.6	Differentiate between strategic tactical and operational level applications.	x	x	x						
IT.30.1.7	Define the role of IS within strategic plan for the total company.	x	x	x						
IT.30.1.8	Define the IS role in process re-engineering.	x	x	x						
IT.30.1.9	Develop short-range IS plan.	x	x	x			x			x
IT.30.1.10	Develop continuous improvement plan.	x	x	x			x			x
IT.30.1.11	Determine functional structures (internal vs. outsourcing).	x	x	x	x	x	x	x	x	x
IT.30.1.12	Establish goals and objectives for IS.	x	x	x	x	x	x	x	x	x
IT.30.1.13	Define mission and critical success factors.	x	x	x						x
IT.30.1.14	Formulate IS operating procedures.	x	x	x			x			
	Standard 30.2: *Establish how information systems will be developed and managed within the organization.*									
IT.30.2.1	Identify hierarchical and flow models of the organization.	x	x	x						
IT.30.2.2	Identify organizational work groups.	x	x	x						x
IT.30.2.3	Define the roles of professional IS personnel within the organization.	x	x	x						
IT.30.2.4	Define the function of IS management.	x	x	x						
IT.30.2.5	Identify drivers and inhibitors of information technology change in the organization.	x	x	x			x			x
IT.30.2.6	Define the role of the cognitive process in information systems design and implementation.	x	x	x						
IT.30.2.7	Identify IS support for decision making.	x	x	x			x			
	Standard 30.3: *Initiate control of IS function.*									
IT.30.3.1	Design a methodology to ensure that external audits will establish consistent goals and accomplishments.	x	x	x	x	x	x	x	x	x
IT.30.3.2	Conduct EDP audits.	x	x	x	x	x	x	x	x	x
IT.30.3.3	Evaluate the advantages and disadvantages of various options for outsourcing IS function.	x	x	x						
IT.30.3.4	Conduct internal and external performance evaluations for IS function.	x	x	x			x			x
IT.30.3.5	Define how information and information systems will be used in documentation, decision making, and control of organizational activity.	x	x	x						x
IT.30.3.6	Define the relationship between systems goals and quality concepts.	x	x	x						x
IT.30.3.7	Define the roles of information technology and of the people using, designing, and managing IT in an organization.	x	x	x	x	x	x	x	x	x
IT.30.3.8	Implement an IS application using code generators.	x	x	x						
IT.30.3.9	Compare the results of implementation using code generators with hand-coded versions of the same application.	x	x	x						
	Standard 30.4: *Manage IS subfunctions.*									
IT.30.4.1	Create technical and end-user telecommunication system documentation.	x	x	x	x	x	x	x	x	x
IT.30.4.2	Identify security and privacy considerations.	x	x	x	x	x	x	x	x	x
IT.30.4.3	Resolve security and privacy issues within the context of the telecommunications system.	x	x	x	x	x	x	x	x	x
IT.30.4.4	Analyze configuration controls.	x	x	x			x			
IT.30.4.5	Develop DBMS projects, including systems development and user documentation.	x	x	x	x	x	x	x	x	x
IT.30.4.6	Develop assignments and performance rating measures to evaluate the development process (working individually or as a member of a team).	x	x	x	x	x	x	x	x	x

IT.30.4.7	Manage computer facilities.	x	x	x	x	x	x	x	x	x
IT.30.4.8	Manage group decision support systems.	x	x	x	x	x	x	x	x	x
IT.30.4.9	Optimize the climate for creativity.	x	x	x	x	x	x	x	x	x
IT.30.4.10	Resolve operational issues associated with system installation.	x	x	x	x	x	x	x	x	x
IT.30.4.11	Manage software engineering activities.	x	x	x	x	x	x	x	x	x
	Standard 30.5: *Apply management principles to IS functions.*									
IT.30.5.1	Identify the characteristics of principle-centered leadership.	x	x	x						
IT.30.5.2	Employ a proactive approach to IS management.	x	x	x	x	x	x	x	x	x
IT.30.5.3	Devise techniques to enhance the creative design process.	x	x	x	x	x	x	x	x	x
IT.30.5.4	Justify the project management approach to be implemented.	x	x	x	x	x	x	x	x	x
	Information System Analysis and Design									
	INSPIRE>Links>Business>Market Research									
	Standard 31.1: *Demonstrate knowledge of the role of systems analysts.*									
IT.31.1.1	Identify the functions of systems analysts.	x	x	x						
IT.31.1.2	Identify the skills required for systems analysts.	x	x	x						
	Standard 31.2: *Initiate a system project.*									
IT.31.2.1	Identify the phases in a system project.	x	x	x						
IT.31.2.2	Select basic fact-gathering techniques to be used.	x	x	x						
IT.31.2.3	Define the scope of the systems project.	x	x	x			x			
IT.31.2.4	Conduct a preliminary investigation.	x	x	x			x			x
	Standard 31.3: *Perform a detailed system investigation and analysis.*									
IT.31.3.1	Identify time, technology and resource constraints.	x	x	x						
IT.31.3.2	Determine investigation techniques to be used.	x	x	x						
IT.31.3.3	Record facts gathered through system investigation.	x	x	x						
IT.31.3.4	Perform appropriate diagnostic tests.	x	x	x			x			
IT.31.3.5	Investigate system alerts.	x	x	x						
IT.31.3.6	Research technical alternatives.	x	x	x			x			
IT.31.3.7	Evaluate technical alternatives.	x	x	x			x			
	Standard 31.4: *Design an information system.*									
IT.31.4.1	Execute the steps in system design.	x	x	x	x	x	x	x	x	x
IT.31.4.2	Design system output, system input, files, and processing.	x	x	x	x	x	x	x	x	x
IT.31.4.3	Analyze the interaction of the operating system and hardware architecture.	x	x	x			x			
IT.31.4.4	Justify the communications selections for the system (e.g., single PCs, LANs and/or WANs).	x	x	x			x			
IT.31.4.5	Present system design to management.	x	x	x	x	x	x	x	x	x
	Standard 31.5: *Develop the information system.*									
IT.31.5.1	Execute tasks involved in system development.	x	x	x	x	x	x	x	x	x
IT.31.5.2	Identify the system components and their relationships.	x	x	x			x			
IT.31.5.3	Specify the workflow system.	x	x	x						
IT.31.5.4	Employ techniques to enhance the creative design process.	x	x	x	x	x	x	x	x	x
IT.31.5.5	Develop programming specifications.	x	x	x	x	x	x	x	x	x
IT.31.5.6	Program the system.	x	x	x			x		x	x
IT.31.5.7	Test the system.	x	x	x			x			
IT.31.5.8	Document the system.	x	x	x			x		x	x
	Standard 31.6: *Evaluate applications within the information system.*									
IT.31.6.1	Design a framework for evaluating information system functions.	x	x	x			x			

IT.31.6.2	Design a framework for evaluating individual applications.	x	x	x			x			
IT.31.6.3	Compare the capabilities of an application with the requirements it is intended to meet.	x	x	x						
IT.31.6.4	Identify alternative outcomes of the application verification process.	x	x	x			x			
IT.31.6.5	Evaluate the results and the probabilities of errors in application software.	x	x	x			x			
IT.31.6.6	Modify inputs, outputs, and processing to refine an application.	x	x	x			x			
IT.31.6.7	Recommend new features or enhancements to existing tools.	x	x	x			x			x
	Standard 31.7: *Develop IS implementation plan.*									
IT.31.7.1	Analyze the effect of IS on the organizational structure.	x	x	x			x			
IT.31.7.2	Depict the interaction between IS and continuous improvement.	x	x	x						x
IT.31.7.3	Specify the teamwork, leadership, and empowerment strategies to be used.	x	x	x	x	x	x	x	x	x
IT.31.7.4	Determine consensus-building process to be used.	x	x	x	x	x	x	x	x	x
IT.31.7.5	Convert existing files.	x	x	x						
IT.31.7.6	Determine the system conversion method to be used.	x	x	x			x			
IT.31.7.7	Document system implementation plans.	x	x	x			x			
	Standard 31.8: *Perform management functions related to the planned change.*									
IT.31.8.1	Schedule system change according to risk.	x	x	x						x
IT.31.8.2	Secure needed approvals for change.									x
IT.31.8.3	Document contingency plans.	x	x	x			x			
IT.31.8.4	Formulate a time line for the implementation of change.	x	x	x	x	x	x	x	x	x
IT.31.8.5	Coordinate activities among work groups.	x	x	x	x	x	x	x	x	x
IT.31.8.6	Perform regression tests.	x	x	x			x			
IT.31.8.7	Document testing results.	x	x	x			x		x	
IT.31.8.8	Initiate problem correction.	x	x	x						
	System Installation and Maintenance									
	INSPIRE>Indiana Links>Business>Indiana Business Review									
	Standard 32.1: *Apply knowledge of the life cycle of an information system.*									
IT.32.1.1	Research the concept of information system life cycles.	x	x	x						
IT.32.1.2	Identify criteria for deciding between acquisition of software packages and custom development of software.	x	x	x						x
	Standard 32.2: *Install system*.									
IT.32.2.1	Develop a detailed training, conversion, and installation plan for an information system application.	x	x	x	x	x	x	x	x	x
IT.32.2.2	Design networked solutions.	x	x	x	x	x	x	x	x	x
IT.32.2.3	Install DBMS on the server.	x	x	x						
IT.32.2.4	Install appropriate operating system and telecommunications hardware and software.	x	x	x	x	x	x	x	x	x
IT.32.2.5	Identify system requirements for various types of installations.	x	x	x						
IT.32.2.6	Evaluate installation requirements.	x	x	x						
IT.32.2.7	Install information system application program in accordance with requirements.	x	x	x						
IT.32.2.8	Evaluate processes and outcomes.	x	x	x			x			
IT.32.2.9	Customize a general-purpose software package to provide specific functionality beyond the default settings.	x	x	x			x		x	x
IT.32.2.10	Add capability to a software system by recording macros and storing them in the system's library.	x	x	x			x			
IT.32.2.11	Access needed technical information using software help facilities.	x	x	x						
IT.32.2.12	Operate server applications.	x	x	x						
IT.32.2.13	Ensure that all multi-user aspects of the application function are operational.	x	x	x			x			
IT.32.2.14	Operate coupled application systems.	x	x	x						
	Standard 32.3: *Perform software configuration and loading.*									
IT.32.3.1	Develop program and system specifications.	x	x	x			x			

IT.32.3.2	Load software with minimum disruption of process flow.	x	x	x			x			
IT.32.3.3	Convert data.	x	x	x						
IT.32.3.4	Resolve compatibility issues.	x	x	x						
IT.32.3.5	Configure software appropriately for system and user application.	x	x	x			x			
IT.32.3.6	Perform software coding.	x	x	x			x			
IT.32.3.7	Participate in application and system development reviews.	x	x	x						x
IT.32.3.8	Evaluate emerging technologies and their potential effect on information system software.	x	x	x			x			
IT.32.3.9	Assemble necessary components to implement information system design.	x	x	x	x	x	x	x	x	x
	Standard 32.4: *Monitor the information system.*									
IT.32.4.1	Conduct post-implementation evaluation.	x	x	x			x			
IT.32.4.2	Identify abnormal system performance.	x	x	x			x			
IT.32.4.3	Determine required service levels.	x	x	x			x			x
IT.32.4.4	Monitor multiple technologies.	x	x	x						
IT.32.4.5	Recognize system alerts.	x	x	x	x	x	x	x	x	x
IT.32.4.6	Recognize security problems.	x	x	x	x	x	x	x	x	x
IT.32.4.7	Recognize environmental problems.	x	x	x	x	x	x	x	x	x
IT.32.4.8	Perform remote monitoring.	x	x	x						
	Standard 32.5: *Perform system maintenance.*									
IT.32.5.1	Demonstrate knowledge of the basic elements of computer maintenance.	x	x	x						
IT.32.5.2	Identify available diagnostic tools used for system maintenance.	x	x	x						
IT.32.5.3	Identify maintenance procedures and processes.	x	x	x						
IT.32.5.4	Identify problems using diagnostic tools.	x	x	x						
IT.32.5.5	Document solutions.	x	x	x			x			
IT.32.5.6	Tear down a computer.	x	x	x						
IT.32.5.7	Identify (by name) new or replacement computer components needed.	x	x	x						
IT.32.5.8	Install/replace computer components.	x	x	x						
IT.32.5.9	Reassemble a computer.	x	x	x						
IT.32.5.10	Establish a preventive maintenance plan.	x	x	x			x		x	x
IT.32.5.11	Perform preventive maintenance on computer components.	x	x	x						
IT.32.5.12	Create maintenance plan for regular integrity checks.	x	x	x			x			x
IT.32.5.13	Evaluate maintenance processes.	x	x	x			x			
IT.32.5.14	Evaluate maintenance outcomes.	x	x	x			x			
	Standard 32.6: *Manage backup and recovery, both on- and off-site.*									
IT.32.6.1	Develop backup plan to be used by technical support group and users.	x	x	x	x	x	x	x	x	x
IT.32.6.2	Develop recovery plan to be used by technical support group and users.	x	x	x	x	x	x	x	x	x
IT.32.6.3	Implement backup procedures in accordance with a regular schedule.	x	x	x						
IT.32.6.4	Implement recovery procedures as needed.	x	x	x						
IT.32.6.5	Evaluate whether backup and recovery plans meet users' needs.	x	x	x			x			
	Standard 32.7: *Troubleshoot problems.*									
IT.32.7.1	Demonstrate knowledge of basic troubleshooting steps.	x	x	x						
IT.32.7.2	Detect problems.	x	x				x			x
IT.32.7.3	Identify criticality of problem.	x	x	x			x			
IT.32.7.4	Perform appropriate analyses to identify problem cause.	x	x	x			x			
IT.32.7.5	Develop resolution plan.	x	x	x			x			
IT.32.7.6	Identify possible solutions.	x	x	x			x			

IT.32.7.7	Test identified solutions.	x	x	x			x			
IT.32.7.8	Select most appropriate solution.	x	x	x			x			
IT.32.7.9	Implement selected solution.	x	x	x			x			
IT.32.7.10	Minimize impact of problems on productivity (e.g., minimize downtime).	x	x	x						x
	Standard 32.8: *Evaluate problem-solving processes and outcomes.*									
IT.32.8.1	Evaluate problem-solving outcomes to determine whether the problem was solved as intended.	x	x	x			x			
IT.32.8.2	Evaluate whether the process was applied in an efficient and responsible manner.	x	x	x			x			x
IT.32.8.3	Assess the validity and usefulness of the outcomes.	x	x	x			x			x
IT.32.8.4	Determine needed follow-up actions.	x	x	x			x			
	Standard 32.9: *Perform software upgrades and fixes.*									
IT.32.9.1	Identify principles governing software acquisition and upgrades.	x	x	x						
IT.32.9.2	Analyze operational problems.	x	x	x			x			
IT.32.9.3	Recommend solutions for operational problems.	x	x	x			x			x
IT.32.9.4	Upgrade software.	x	x	x			x	x	x	x
	System Administration and Control									
	INSPIRE>Business>Inside Indiana Business									
	Standard 33.1: *Perform general system administration tasks.*									
IT.33.1.1	Facilitate the delivery of technical services.	x	x	x					x	x
IT.33.1.2	Set up/maintain user accounts on multiple systems.	x	x	x						
IT.33.1.3	Provide technical product support.	x	x	x						x
IT.33.1.4	Perform planning for overall system functions.	x	x	x						x
IT.33.1.5	Prepare cost justifications.	x	x	x	x	x	x	x	x	x
IT.33.1.6	Manage inventory and assets.	x	x	x						
IT.33.1.7	Identify new application requirements within the system.	x	x	x			x	x		
IT.33.1.8	Participate in the evaluation, analysis, and recommendation of technical computing products.	x	x	x	x	x	x	x	x	x
IT.33.1.9	Participate in evaluation of total system.	x	x	x	x	x	x	x	x	x
IT.33.1.10	Document performance problems.	x	x	x			x		x	
IT.33.1.11	Retrieve historical data for trend analysis.	x	x	x						
IT.33.1.12	Analyze historical data to identify trends.	x	x	x			x			
IT.33.1.13	Provide input on technical procedures.	x	x	x			x			x
IT.33.1.14	Increase knowledge of system infrastructure.	x	x	x						
IT.33.1.15	Formulate technical procedures.	x	x	x			x			
IT.33.1.16	Prepare documentation manuals.	x	x	x	x	x	x	x	x	x
IT.33.1.17	Prepare required reports.	x	x	x	x	x	x	x	x	x
IT.33.1.18	Maintain technical industry knowledge.	x	x	x						
	Project Management.									
	INSPIRE>EBSCO Host>Business Source									
	Standard 34.1: *Manage information system project methodologies.*									
IT.34.1.1	Define the project's contribution to business needs.	x	x	x						x
IT.34.1.2	Define the scope of the project.	x	x	x			x			x
IT.34.1.3	Identify stakeholders and decision makers.	x	x	x			x			
IT.34.1.4	Identify escalation procedures.	x	x	x						
IT.34.1.5	Develop task list (work breakdown structures).	x	x	x					x	x
IT.34.1.6	Evaluate project requirements.	x	x	x			x			
IT.34.1.7	Identify required resources and budget.	x	x	x			x			

IT.34.1.8	Secure needed resources.	x	x	x			x	x	x	x
IT.34.1.9	Estimate time requirements.	x	x	x			x		x	x
IT.34.1.10	Develop initial project management flowchart.	x	x	x		x	x			x
IT.34.1.11	Identify interdependencies.	x	x	x		x	x			x
IT.34.1.12	Identify critical milestones.	x	x	x		x	x			x
IT.34.1.13	Evaluate risks.	x	x	x	x	x	x	x	x	x
IT.34.1.14	Prepare contingency plan.	x	x	x	x	x	x	x	x	x
IT.34.1.15	Manage the change control process.	x	x	x						x
IT.34.1.16	Track critical milestones.	x	x	x			x			
IT.34.1.17	Participate in project phase review.	x	x	x			x			x
IT.34.1.18	Report project status.	x	x	x			x			x
IT.34.1.19	Utilize project management software.	x	x	x						
IT.34.1.20	Develop a method of evaluation.	x	x	x	x	x	x	x	x	x
	Standard 34.2: *Define scope of work to achieve individual and group goals.*									
IT.34.2.1	Assess the task's contribution to overall business needs.	x	x	x			x			x
IT.34.2.2	Identify size and specifics of the task.	x	x	x			x			
IT.34.2.3	Formulate task sequence.	x	x	x			x			
IT.34.2.4	Plan multiple tasks simultaneously.	x	x	x			x			x
IT.34.2.5	Identify potential problems.	x	x	x			x			
IT.34.2.6	Develop contingency plans.	x	x	x	x	x	x	x	x	x
	Standard 34.3: *Develop time and activity plan to achieve objectives.*									
IT.34.3.1	Coordinate plan with team, cross-functional groups, or individuals.	x	x	x	x	x	x	x	x	x
IT.34.3.2	Formulate a task strategy.	x	x	x			x			
IT.34.3.3	Prioritize tasks according to business needs.	x	x	x			x			x
IT.34.3.4	Manage multiple tasks simultaneously.	x	x	x			x			x
IT.34.3.5	Devise plan of action.	x	x	x	x	x	x	x	x	x
	Standard 34.4: *Manage work processes and procedures.*									
IT.34.4.1	Design an approach to directory organization and file naming that will support access to data.	x	x	x			x			
IT.34.4.2	Analyze situation.	x	x	x			x			
IT.34.4.3	Create work plan based on analysis of situation.	x	x	x			x			
IT.34.4.4	Identify supplies and tools needed.	x	x	x			x			
IT.34.4.5	Develop budget guidelines.	x	x	x			x			
IT.34.4.6	Coordinate work processes and procedures.	x	x	x	x	x	x	x	x	x
IT.34.4.7	Monitor work processes and procedures.	x	x	x						x
IT.34.4.8	Evaluate work processes and procedures.	x	x	x			x			x
IT.34.4.9	Generate task status reports.	x	x	x			x			x
	Communication									
	INSPIRE>EBSCO Host>MasterFILE									
	Standard 35.1: *Apply communication skills.*									
IT.35.1.1	Guide communication activities using established rules for grammar, spelling, and sentence construction.	x	x	x						
IT.35.1.2	Follow written and/or oral instructions.	x	x	x	x	x	x	x	x	x
IT.35.1.3	Apply creativity in oral and written communications.	x	x	x	x	x	x	x	x	x
IT.35.1.4	Proofread documents.	x	x	x						
IT.35.1.5	Interpret oral, written, and nonverbal communications.	x	x	x	x	x	x	x	x	x
IT.35.1.6	Evaluate audience (e.g., specific interests, level of technical knowledge).	x	x	x	x	x	x	x	x	x

IT.35.1.7	Adjust communication style to fit audience (e.g., use of jargon, level of technical details).	x	x	x	x	x	x	x	x	x
IT.35.1.8	Determine means of communications appropriate for given situations (e.g., telephone, meeting, electronic mail, and written communication).	x	x	x	x	x	x	x	x	x
IT.35.1.9	Reinforce intended message using nonverbal communication.	x	x	x	x	x	x	x	x	x
IT.35.1.10	Influence listeners' perceptions through precision questioning.	x	x	x	x	x	x	x	x	x
IT.35.1.11	Practice active listening skills (e.g., paraphrasing).	x	x	x	x	x	x	x	x	x
IT.35.1.12	Obtain needed information using questioning techniques.	x	x	x	x	x	x	x	x	x
IT.35.1.13	Adjust message and/or its delivery based on feedback from listeners (verbal and nonverbal).	x	x	x	x	x	x	x	x	x
IT.35.1.14	Participate in group discussions and meetings.	x	x	x	x	x	x	x	x	x
IT.35.1.15	Assess/refine communication skills.	x	x	x	x	x	x	x	x	x
	Standard 35.2: *Compose documents.*									
IT.35.2.1	Demonstrate knowledge of the characteristics of different approaches to writing (e.g., direct, indirect, and persuasive).	x	x	x						
IT.35.2.2	Demonstrate knowledge of components of an effective message (e.g., clear, concise, complete, accurate, and courteous).	x	x	x						
IT.35.2.3	Evaluate audience.	x	x	x						x
IT.35.2.4	Gather information.	x	x	x						
IT.35.2.5	Organize information.	x	x	x						
IT.35.2.6	Develop outline.	x	x	x			x			
IT.35.2.7	Draft document in accordance with established standards for communication.	x	x	x			x			
IT.35.2.8	Verify spelling, grammar, and punctuation.	x	x	x						
IT.35.2.9	Verify accuracy of content.	x	x	x						
IT.35.2.10	Prepare final document.	x	x	x	x	x	x	x	x	x
	Standard 35.3: *Demonstrate sensitivity in communicating with a diverse workforce.*									
IT.35.3.1	Identify factors (e.g., culture, ethnicity, equity, special/exceptional needs) that impact communication.	x	x	x						
IT.35.3.2	Identify strategies for successful communication with a diverse workforce.	x	x	x						
IT.35.3.3	Determine communication style appropriate for listener(s).	x	x	x			x			
IT.35.3.4	Bridge communication styles.	x	x	x			x			x
IT.35.3.5	Establish guidelines for dealing with conflict.	x	x	x			x		x	x
	Standard 35.4: *Deliver oral presentations.*									
IT.35.4.1	Prepare presentation and supporting materials (e.g., handouts, transparencies, electronic slide shows).	x	x	x	x	x	x	x	x	x
IT.35.4.2	Practice presentation.	x	x	x						
IT.35.4.3	Deliver presentation incorporating both verbal and nonverbal communication skills.	x	x	x	x	x	x	x	x	x
IT.35.4.4	Obtain feedback on the effectiveness of presentation.	x	x	x	x	x	x	x	x	x
	Standard 35.5: *Build interpersonal skills with individuals and other team members.*									
IT.35.5.1	Analyze the interdependence of empathetic listening, synergy, and consensus building.	x	x	x						x
IT.35.5.2	Define roles within the group decision-making process.	x	x	x						
IT.35.5.3	Apply knowledge of group dynamics.	x	x	x	x	x	x	x	x	x
IT.35.5.4	Promote teamwork, leadership, and empowerment.	x	x	x	x	x	x	x	x	x
IT.35.5.5	Identify strategies for fostering creativity.	x	x	x			x			
IT.35.5.6	Recognize the effect of influence, power, and politics on communication.	x	x	x				x	x	x
IT.35.5.7	Establish negotiation guidelines.	x	x	x	x	x	x	x	x	x

	Technical Writing and Documentation									
	INSPIRE>EBSCO Host>Academic Search									
	Standard 36.1: *Evaluate technical writing requirements.*									
IT.36.1.1	Define/prioritize communication needs.	x	x	x			x			
IT.36.1.2	Resolve conflicting requirements.	x	x	x			x			
IT.36.1.3	Specify project objectives.	x	x	x			x			
IT.36.1.4	Determine the size and specifics of the work to be completed.	x	x	x			x			
IT.36.1.5	Estimate time, materials, and capabilities needed to complete assignment.	x	x	x	x	x	x	x	x	x
IT.36.1.6	Identify criteria for successful completion of project.	x	x	x			x		x	
IT.36.1.7	Evaluate strengths and weaknesses of completed project.	x	x	x			x		x	
	Standard 36.2: *Write technical reports.*									
IT.36.2.1	Determine audience.	x	x							
IT.36.2.2	Access needed information using standard references and sources.	x	x							
IT.36.2.3	Identify type of report needed.	x	x							
IT.36.2.4	Compile relevant data.	x	x	x						
IT.36.2.5	Organize data into charts and graphs.	x	x	x						
IT.36.2.6	Analyze data.	x	x	x			x			
IT.36.2.7	Draw conclusions from data analysis.	x	x	x			x			
IT.36.2.8	Outline report.	x	x	x						
IT.36.2.9	Draft report.	x	x	x	z	x	x	x	x	x
IT.36.2.10	Edit report (e.g., check spelling, grammar, punctuation, sentence structure, accuracy of content).	x	x	x			x			
IT.36.2.11	Review report with peers.	x	x	x	x	x	x	x	x	x
IT.36.2.12	Revise report as needed based on peer feedback.	x	x	x	x	x	x	x	x	x
IT.36.2.13	Proofread revised report.	x	x	x			x			
IT.36.2.14	Present reports.	x	x	x	x	x	x	x	x	x
	Standard 36.3: *Conduct technical research.*									
IT.36.3.1	Identify target audience.	x	x							
IT.36.3.2	Define research questions.	x	x	x						
IT.36.3.3	Determine priorities for the information that should be gathered.	x	x	x						
IT.36.3.4	Identify potential sources of information.	x	x	x			x			
IT.36.3.5	Target audience/user group as a key information source.	x	x	x						x
IT.36.3.6	Identify subject-matter experts.	x	x	x			x			x
IT.36.3.7	Evaluate potential sources of information based on established criteria (e.g., affordability, relevance).	x	x	x						
IT.36.3.8	Conduct interviews with selected human information sources.	x	x	x			x			x
IT.36.3.9	Gather information from selected print and electronic sources.	x	x	x	x	x	x	x	x	x
IT.36.3.10	Determine the accuracy and completeness of the information gathered.	x	x	x			x			
	Standard 36.4: *Design technical documentation.*									
IT.36.4.1	Define purpose of documentation.	x	x	x						
IT.36.4.2	Specify standards for documentation, including critical success criteria.	x	x	x			x			
IT.36.4.3	Identify delivery options.	x	x	x						
IT.36.4.4	Evaluate cost-effectiveness of each delivery option.	x	x	x			x			
IT.36.4.5	Select tools appropriate for task purpose.	x	x	x						
IT.36.4.6	Plan information flow.	x	x	x	x	x	x	x	x	x
IT.36.4.7	Select writing style and tone appropriate for given documentation.	x	x	x			x			x
IT.36.4.8	Determine level of detail needed.	x	x	x			x			x

IT.36.4.9	Identify visuals appropriate for given documentation.	x	x	x			x			x
IT.36.4.10	Provide feedback on design to development team/individual.	x	x	x			x			x
	Standard 36.5: *Develop technical documentation* .									
IT.36.5.1	Determine audience.	x	x							
IT.36.5.2	Identify parameters.	x	x	x						
IT.36.5.3	Monitor development progress.	x	x	x						x
IT.36.5.4	Ask questions.	x	x	x	x	x	x	x	x	x
IT.36.5.5	Interpret specifications or drawings for target audience.	x	x	x						
IT.36.5.6	Record process (e.g., flowchart, step-by-step narrative).	x	x	x						
IT.36.5.7	Record data.	x	x	x					x	
IT.36.5.8	Maintain test logs.	x	x	x					x	
IT.36.5.9	Compile cumulative reference/record.	x	x							
IT.36.5.10	Measure compliance with established parameters.	x	x	x			x		x	
IT.36.5.11	Verify the accuracy and validity of the information.	x	x	x					x	
IT.36.5.12	Select information relevant to and appropriate for the given documentation.	x	x	x						
IT.36.5.13	Organize/synthesize information.	x	x	x			x			
IT.36.5.14	Present content in clear and concise way.	x	x	x			x		x	
IT.36.5.15	Translate technical terminology into understandable terms (for audience).	x	x	x			x			
IT.36.5.16	Employ presentation tools and techniques appropriate for the given documentation.	x	x	x						
IT.36.5.17	Obtain feedback on the information provided and its technical accuracy.	x	x	x			x			x
IT.36.5.18	Draft procedures.	x	x	x	x	x	x	x	x	x
IT.36.5.19	Test documentation for usability.	x	x	x			x			x
IT.36.5.20	Edit documentation for readability, grammar, and usage.	x	x	x			x			x
IT.36.5.21	Publish documentation.			x						
IT.36.5.22	Maintain required logs.			x						
IT.36.5.23	Track expenses involved.			x						
	Customer Relations									
	INSPIRE>EBSCO Host>Business Source									
	Standard 37.1: *Build customer relations.*									
IT.37.1.1	Identify organizations' products and services (including own strengths as a sales agent).	x	x	x						
IT.37.1.2	Recognize the importance of all customers to the business.	x	x	x						x
IT.37.1.3	Determine customers' individual needs.	x	x	x						x
IT.37.1.4	Project a professional business image (e.g., appearance, voice, grammar, word usage, enunciation, nonverbal communication, personal hygiene, appropriate attire).	x	x	x						x
IT.37.1.5	Interact with customers and colleagues in a professional manner (e.g., prompt, friendly, courteous, respectful, helpful, knowledgeable, understandable).	x	x	x	x	x	x	x	x	x
IT.37.1.6	Comply with established business protocols and company policies.	x	x	x						
IT.37.1.7	Communicate company policies to customers.	x	x	x	x	x	x	x	x	x
IT.37.1.8	Handle merchandise returns in accordance with customer service policy.	x	x	x	x	x	x	x	x	x
IT.37.1.9	Handle customer complaints in accordance with customer service policy.	x	x	x	x	x	x	x	x	x
IT.37.1.10	Facilitate customer service through the maintenance of key information systems.	x	x	x						x
IT.37.1.11	Follow through on commitments made to customers (e.g., special orders, delivery specifications, new items).	x	x	x	x	x	x	x	x	x
IT.37.1.12	Maintain customer base.	x	x	x	x	x	x	x	x	x
IT.37.1.13	Explain technical information to customers in laymen's terms.	x	x	x	x	x	x	x	x	

	Standard 37.2: *Perform scheduling functions to meet customers' needs.*									
IT.37.2.1	Create calendars/schedules.	x	x	x	x	x	x	x	x	x
IT.37.2.2	Maintain appointment calendars.	x	x	x						
IT.37.2.3	Process requests for appointments.	x	x	x						
IT.37.2.4	Verify appointments.	x	x	x						x
IT.37.2.5	Notify customers of changes in schedule.	x	x	x	x	x	x	x	x	x
IT.37.2.6	Manage scheduling conflicts.	x	x	x	x	x	x	x	x	x
IT.37.2.7	Document results.	x	x	x					x	x
	Economic and Business Concepts									
	INSPIRE>Indiana Links>Business>Indiana Business Review									
	Standard 38.1: *Characterize the nature of business.*									
IT.38.1.1	Identify types of business organizations and functions.	x	x	x						
IT.38.1.2	Demonstrate knowledge of the components of a business plan.	x	x	x						
IT.38.1.3	Identify business reporting and information flow.	x	x	x						
IT.38.1.4	Identify the ways in which organizational functions are interdependent.	x	x	x						
IT.38.1.5	Identify types of communication channels (e.g., formal, informal).	x	x	x						
IT.38.1.6	Determine how business activities interface with data processing functions.	x	x	x			x			
IT.38.1.7	Define stakeholder relationships (e.g., customers, employees, shareholders, and suppliers).	x	x	x						x
IT.38.1.8	Define the role of strategic planning in business.	x	x	x						
IT.38.1.9	Identify generally accepted business ethics (NS,PSD).	x	x	x	x	x	x	x	x	x
IT.38.1.10	Differentiate between ethics and legality.	x	x	x	x	x	x	x	x	x
	Standard 38.2: Interpret economic concepts.									
IT.38.2.1	Demonstrate knowledge of basic economic concepts.	x	x	x						
IT.38.2.2	Interpret economic terminology.	x	x	x						
IT.38.2.3	Identify the characteristics of a free enterprise system.	x	x	x						
IT.38.2.4	Compare/contrast various forms of competition (e.g., pure competition, oligopoly monopoly).	x	x	x						
IT.38.2.5	Demonstrate knowledge of the cyclical nature of the economy (e.g., unemployment, recession, inflation, balance of trade, and budget deficits).	x	x	x						
IT.38.2.6	Identify the effects of public and private economic activity on the business sector.	x	x	x						
IT.38.2.7	Identify how world economic/geographic factors (e.g., concepts, boundaries, barriers, cultures, and politics) affect the balance of trade and import/export processes.	x	x	x	x	x	x	x	x	x
IT.38.2.8	Compare/contrast foreign economic and political systems.	x	x	x	x	x	x	x	x	x
IT.38.2.9	Compare/contrast international and U.S. banking practices.	x	x	x	x	x	x	x	x	x
IT.38.2.10	Apply economic concepts to the global market.	x	x	x	x	x	x	x	x	x
	Standard 38.3: *Interpret marketing concepts.*									
IT.38.3.1	Demonstrate knowledge of basic marketing concepts (internal and external).	x	x	x						
IT.38.3.2	Interpret marketing terminology.	x	x	x						
IT.38.3.3	Analyze ways in which businesses compete with one another.	x	x	x			x			
IT.38.3.4	Identify target markets.	x	x	x						
IT.38.3.5	Analyze internal and external markets.	x	x	x			x			
IT.38.3.6	Determine appropriate customer service levels.	x	x	x						
IT.38.3.7	Determine strategies for relating to different types of customers.	x	x	x						
IT.38.3.8	Determine strategies for monitoring internal and external customer needs.	x	x	x						
IT.38.3.9	Determine alternative marketing strategies.	x	x	x						
IT.38.3.10	Select marketing concepts appropriate to identified markets.	x	x	x						

	Standard 38.4: *Clarify management concepts.*									
IT.38.4.1	Demonstrate knowledge of the major functions of management.	x	x	x						
IT.38.4.2	Identify the activities that are part of each management function.	x	x	x					x	
IT.38.4.3	Compare/contrast management functions.	x	x	x						
IT.38.4.4	Analyze management styles.	x	x	x			x			
IT.38.4.5	Assess the role of authority, accountability, and responsibility in task accomplishment.	x	x	x			x		x	
IT.38.4.6	Demonstrate knowledge of problem-solving steps and techniques.	x	x	x					x	
IT.38.4.7	Demonstrate knowledge of decision-making skills and techniques.	x	x	x					x	
IT.38.4.8	Demonstrate knowledge of critical thinking skills and techniques.	x	x	x					x	
IT.38.4.9	Demonstrate knowledge of past, current, and emerging management trends (e.g., quality circles, suggestion systems, total quality management, risk management, total preventive maintenance, continuous improvement, time management, team building, inventory management, flexible time).	x	x	x					x	
	Financial Management Functions									
	INSPIRE>Indiana Links>Business>Indiana Business Magazine									
	Standard 39.1: *Demonstrate knowledge of management's role in operating a business.*									
IT.39.1.1	Recognize the importance of organizational skills.	x	x	x						
IT.39.1.2	Compare/contrast specific management techniques.	x	x	x						
IT.39.1.3	Recognize the importance of time management.	x	x	x						
IT.39.1.4	Identify the benefits of membership in professional/trade associations.	x	x	x						
IT.39.1.5	Identify the characteristics and functions of a professional support system.	x	x	x						
	Standard 39.2: *Apply basic accounting concepts and principles.*									
IT.39.2.1	Demonstrate knowledge of basic accounting principles and applications.	x	x	x					x	
IT.39.2.2	Interpret accounting terminology.	x	x	x					x	
IT.39.2.3	Utilize financial control procedures.	x	x	x						
IT.39.2.4	Utilize record-keeping procedures for specific business and economic applications.	x	x	x					x	
IT.39.2.5	Select computer accounting applications.	x	x	x						
IT.39.2.6	Evaluate periodic reporting procedures.	x	x	x					x	
	Standard 39.3: *Perform basic accounting functions.*									
IT.39.3.1	Analyze transactions.	x	x	x			x			
IT.39.3.2	Record transactions.	x	x	x						
IT.39.3.3	Monitor expense accounts.	x	x	x						
IT.39.3.4	Prepare budgets.	x	x	x			x			
IT.39.3.5	Process purchases.	x	x	x						
	Standard 39.4: Prepare financial statements.									
IT.39.4.1	Prepare balance sheets.	x	x	x					x	
IT.39.4.2	Prepare income statements.	x	x	x					x	
IT.39.4.3	Interpret financial statements.	x	x	x			x		x	
IT.39.4.4	Prepare cash-flow statements.	x	x	x					x	
IT.39.4.5	Prepare change-in-equity statements.	x	x	x					x	
	Standard 39.5: *Analyze financial performance.*									
IT.39.5.1	Interpret balance sheets.	x	x	x			x		x	
IT.39.5.2	Interpret income statements.	x	x	x			x		x	
IT.39.5.3	Perform cash-flow analyses.	x	x	x			x		x	
IT.39.5.4	Interpret cash-flow analysis statements.	x	x	x			x		x	
IT.39.5.5	Prepare break-even analyses.	x	x	x			x		x	

IT.39.5.6	Prepare budgets.	x	x	x	x	x	x	x	x	x
IT.39.5.7	Prepare comparative financial statements.	x	x	x					x	
IT.39.5.8	Prepare cost and revenue analyses.	x	x	x			x		x	
	Standard 39.6: *Use financial statements to make business decisions.*									
IT.39.6.1	Prepare budgets based on cost and revenue analyses.	x	x	x	x	x	x	x	x	x
IT.39.6.2	Calculate profitability ratios from financial statements.	x	x	x			x			
IT.39.6.3	Interpret cash-flow analysis statements.	x	x	x			x			
IT.39.6.4	Document the impact of financial analysis on the strategic planning process.	x	x	x			x			
IT.39.6.5	Revise short-term and strategic plans based on financial analyses.	x	x	x			x		x	
	International Business									
	INSPIRE>Links>Business>International Business									
	Standard 40.1: *Develop communication skills for an international audience.*									
IT.40.1.1	Identify the customs of the recipient that impact communication.	x	x	x	x	x	x	x	x	x
IT.40.1.2	Find answers to questions related to international communications using available human, print, and electronic sources.	x	x	x	x	x	x	x	x	x
IT.40.1.3	Prepare documents in correct style for international communications.	x	x	x	x	x	x	x	x	x
	Standard 40.2: *Analyze the cultural demographics of major world regions.*									
IT.40.2.1	Identify the major cultural groups of the United States.	x	x	x						
IT.40.2.2	Compare/contrast cultural groups between countries.	x	x	x						
IT.40.2.3	Compare/contrast cultural groups within a country.	x	x	x						
IT.40.2.4	Identify the major cultural groups of East Asia.	x	x	x						
IT.40.2.5	Identify the major cultural groups of the Asian Sub-continent.	x	x	x						
IT.40.2.6	Identify the major cultural groups of the Middle East.	x	x	x						
IT.40.2.7	Identify the major cultural groups of Sub-Saharan Africa.	x	x	x						
IT.40.2.8	Identify the major cultural groups of Eastern Europe.	x	x	x						
IT.40.2.9	Identify the major cultural groups of Western Europe.	x	x	x						
IT.40.2.10	Identify the major cultural groups of Latin America.	x	x	x						
	Standard 40.3: *Identify cultural customs that may impact international business.*									
IT.40.3.1	Identify cultural differences in food, dress, and social behaviors.	x	x	x	x	x	x	x	x	x
IT.40.3.2	Compare the use of calendars in different societies.	x	x	x				x		x
IT.40.3.3	Identify major holidays celebrated by different cultures and how they are celebrated.	x	x	x				x	x	x
IT.40.3.4	Identify the importance of gift-giving in various cultures.	x	x	x	x	x	x	x	x	x
	Standard 40.4: *Analyze the impact of the cultural environment on business.*									
IT.40.4.1	Demonstrate knowledge of how culture influences business operations.	x	x	x						x
IT.40.4.2	Identify social and cultural sectors that affect the conduct of business.	x	x	x						x
IT.40.4.3	Compare/contrast business practices in different cultures.	x	x	x	x	x	x	x	x	x
IT.40.4.4	Compare/contrast the steps used to receive business visitors in different countries.	x	x	x	x	x	x	x	x	x
IT.40.4.5	Compare/contrast the negotiation tactics and decision-making processes used in various cultures.	x	x	x	x	x	x	x	x	x
IT.40.4.6	Compare/contrasts types of business relationships maintained in various cultures.	x	x	x	x	x	x	x	x	x
IT.40.4.7	Compare/contrast business entertainment practices in various parts of the world.	x	x	x	x	x	x	x	x	x
IT.40.4.8	Identify cultural attitudes and practices in the U.S. that could inhibit successful business operations in another country.	x	x	x	x	x	x	x	x	x
IT.40.4.9	Determine modifications to American business practices required for success in the global marketplace.	x	x	x	x	x	x	x	x	x

	Management and Supervision									
	INSPIRE>Links>Business>CEO Express									
	Standard 41.1: *Maintain a safe working environment.*									
IT.41.1.1	Demonstrate knowledge of the relationship between health, safety, and productivity.	x	x	x						
IT.41.1.2	Identify health and safety standards established by government agencies.	x	x	x						x
IT.41.1.3	Access needed safety information using company and manufacturers' references (e.g., procedural manuals, documentation, standards, and flowcharts).	x	x	x						
IT.41.1.4	Establish preventive measure for dealing with the main causes of accidents in the facility.	x	x	x	x	x	x	x	x	x
IT.41.1.5	Establish preventive measures for dealing with the main causes of health problems in the facility.	x	x	x	x	x	x	x	x	x
IT.41.1.6	Establish preventive measures for dealing with violations of personnel security.	x	x	x	x	x	x	x	x	x
IT.41.1.7	Ensure compliance with government and/or company rules and regulations related to health and safety.	x	x	x	x	x	x	x	x	x
IT.41.1.8	Ensure maintenance of a clean work area.	x	x	x	x	x	x	x	x	x
IT.41.1.9	Perform safety audits and inspections.	x	x	x	x	x	x	x	x	x
IT.41.1.10	Solve safety problems using problem solving, decision-making, and critical thinking strategies.	x	x	x	x	x	x	x	x	x
	Standard 41.2: *Guide progress in assigned areas of responsibility/accountability.*									
IT.41.2.1	Set short- and long-term goals for assigned areas of responsibility/accountability.	x	x	x						x
IT.41.2.2	Demonstrate commitment to established goals and vision.	x	x	x					x	
IT.41.2.3	Obtain support for goals.	x	x	x						x
IT.41.2.4	Provide support for goals.	x	x	x					x	x
IT.41.2.5	Monitor goal achievement.	x	x	x					x	
IT.41.2.6	Adjust goals.	x	x	x					x	
IT.41.2.7	Communicate goal achievement.	x	x	x					x	x
IT.41.2.8	Provide recognition for goal achievement.	x	x	x	x	x	x	x	x	x
	Standard 41.3: *Provide employee development activities.*									
IT.41.3.1	Analyze employee development needs (e.g., retraining, updating, stress management).	x	x	x			x			x
IT.41.3.2	Select development strategies designed to meet individual and group needs.	x	x	x			x			x
IT.41.3.3	Identify the benefits of employee development activities offered outside the organization.	x	x	x			x			x
IT.41.3.4	Secure personnel resources, materials, and equipment needed for employee development activities.	x	x	x			x		x	x
IT.41.3.5	Monitor employee development activities.	x	x	x			x			
IT.41.3.6	Keep employees informed about development opportunities.	x	x	x	x	x	x	x	x	x
IT.41.3.7	Encourage employee participation in development activities.	x	x	x						x
IT.41.3.8	Evaluate employee progress.	x	x	x			x			x
IT.41.3.9	Provide feedback to employees concerning their progress.	x	x	x			x			x
IT.41.3.10	Provide formal and informal recognition for employee development.	x	x	x		x			x	x
	Standard 41.4: Perform strategic planning functions.									
IT.41.4.1	Guide the planning process using problem-solving, decision-making, and critical thinking strategies.	x	x	x	x	x	x	x	x	x
IT.41.4.2	Analyze needs.	x	x	x			x			
IT.41.4.3	Secure needed information through research.	x	x	x						
IT.41.4.4	Develop goals and objectives.	x	x	x			x		x	
IT.41.4.5	Prioritize goals and objectives.	x	x	x			x		x	
IT.41.4.6	Develop action plan for achieving objectives.	x	x	x	x	x	x	x	x	x
IT.41.4.7	Project trends and outcomes using forecasting techniques.	x	x	x			x			
IT.41.4.8	Prepare budgets.	x	x	x			x		x	
IT.41.4.9	Analyze budgets.	x	x	x			x			
IT.41.4.10	Develop strategic plan.	x	x	x	x	x	x	x	x	x

	Standard 41.5: *Perform routine management functions.*									
IT.41.5.1	Guide the management process using problem-solving, decision-making, and critical thinking strategies.	x	x	x	x	x	x	x	x	x
IT.41.5.2	Develop management objectives.	x	x	x			x			
IT.41.5.3	Conduct task analyses.	x	x	x			x			
IT.41.5.4	Create/maintain organizational and/or departmental charts.	x	x	x	x	x	x	x	x	x
IT.41.5.5	Maintain procedure manuals.	x	x	x						
IT.41.5.6	Solve space utilization problems using math and problem-solving skills.	x	x	x						
IT.41.5.7	Follow the chain of command.	x	x	x					x	x
IT.41.5.8	Maintain confidentiality.	x	x						x	x
IT.41.5.9	Clarify company policies and procedures.	x	x	x			x			
IT.41.5.10	Communicate cost-containment factors.	x	x	x	x	x	x	x	x	x
IT.41.5.11	Monitor budget activity.	x	x	x						
IT.41.5.12	Prepare managerial reports.	x	x	x	x	x	x	x	x	x
IT.41.5.13	Analyze daily production reports.	x	x	x		x	x			
IT.41.5.14	Represent the organization to the public.	x	x	x	x	x	x	x	x	x
	Standard 41.6: *Manage work flow and operations.*									
IT.41.6.1	Plan physical layout and work flow.	x	x	x			x			
IT.41.6.2	Illustrate business or job procedures/operations using flowcharts.	x	x	x			x			
IT.41.6.3	Prioritize work.	x	x	x			x			
IT.41.6.4	Establish/maintain operating policies and procedures.	x	x	x	x	x	x	x	x	x
IT.41.6.5	Establish/maintain production standards.	x	x	x	x	x	x	x	x	x
IT.41.6.6	Establish/maintain linkages with other departments.	x	x	x	x	x	x	x	x	x
IT.41.6.7	Systematize work.	x	x	x			x			x
IT.41.6.8	Delegate work.	x	x						x	x
IT.41.6.9	Communicate operating policies and procedures, priorities, linkages, and standards to others.	x	x	x	x	x	x	x	x	x
IT.41.6.10	Provide work assignments and instructions.	x	x	x	x	x	x	x	x	x
IT.41.6.11	Monitor progress.	x	x	x						
IT.41.6.12	Solve work flow/operations problems using problem-solving, decision-making, and critical thinking strategies.	x	x	x	x	x	x	x	x	x
IT.41.6.13	Prepare productivity reports.	x	x	x	x	x	x	x	x	x
IT.41.6.14	Communicate contents of productivity reports to others in accordance with company procedures.	x	x	x	x	x	x	x	x	x
	Standard 41.7: *Conduct meetings.*									
IT.41.7.1	Plan meeting.	x	x	x						
IT.41.7.2	Set agenda.	x	x	x						
IT.41.7.3	Schedule meeting.	x	x	x						x
IT.41.7.4	Reserve meeting room.	x	x	x						x
IT.41.7.5	Invite appropriate personnel.	x	x	x						x
IT.41.7.6	Identify need for outside speakers.	x	x	x						
IT.41.7.7	Assign someone to take minutes.	x	x	x						x
IT.41.7.8	Make introductions.	x	x	x	x	x	x	x	x	x
IT.41.7.9	Invite questions, comments, and group participation.	x	x	x	x	x	x	x	x	x
IT.41.7.10	Determine appropriate action, time frame, and person accountable for identified tasks.	x	x	x	x	x	x	x	x	x
IT.41.7.11	Monitor time.	x	x	x						
IT.41.7.12	Publish minutes in timely manner.	x	x	x		x	x			
	Standard 41.8: *Maintain company security.*									
IT.41.8.1	Access needed information using company references.	x	x	x						

IT.41.8.2	Plan security procedures in accordance with business ethics.	x	x	x	x	x	x	x	x	x
IT.41.8.3	Communicate security procedures internally.	x	x	x	x	x	x	x	x	x
IT.41.8.4	Ensure compliance with security procedures.	x	x	x	x	x	x	x	x	x
IT.41.8.5	Document security procedures.	x	x	x						
IT.41.8.6	Perform security checks.	x	x	x	x	x	x	x	x	x
IT.41.8.7	Correct security problems.	x	x	x	x	x	x	x	x	x
	Standard 41.9: *Support the company's social and community involvement.*									
IT.41.9.1	Propose environmental, educational, and community needs and social issues on which to focus company support.	x	x	x	x	x	x	x	x	x
IT.41.9.2	Select issues on which to focus company support.	x	x	x	x	x	x	x	x	x
IT.41.9.3	Participate in social and/or community activities.	x	x	x	x	x	x	x	x	x
IT.41.9.4	Encourage staff involvement.	x	x	x	x	x	x	x	x	x
IT.41.9.5	Recognize the importance of the company's social and community relationships and their effects on the company.	x	x	x	x	x	x	x	x	x
	Business Law, Ethics and Legal Issues									
	INSPIRE>Links>Business>Business.com									
	Standard 42.1: *Demonstrate knowledge of legal rights and responsibilities.*									
IT.42.1.1	Identify major types of laws.	x	x	x						
IT.42.1.2	Differentiate between crimes and torts (e.g., terminology, conceptual development).	x	x	x						
IT.42.1.3	Differentiate between criminal and civil law.	x	x	x						
IT.42.1.4	Differentiate between state and federal court systems.	x	x	x						
IT.42.1.5	Demonstrate knowledge of the court system procedural process (e.g., how a case goes to trial).	x	x	x						
IT.42.1.6	Determine the practical implications of lawsuits in terms of good will, client relations, the bottom line, diversion of company resources, cash flow and accounts receivable.	x	x	x			x	x	x	x
IT.42.1.7	Demonstrate knowledge of basic business law concepts.	x	x	x						
IT.42.1.8	Relate current laws and regulations to company contracts, policies, and procedures.	x	x	x					x	x
IT.42.1.9	Demonstrate knowledge of legal terminology.	x	x	x						
IT.42.1.10	Establish procedures for maintaining the confidentiality of client information.	x	x	x				x	x	x
	Standard 42.2: *Demonstrate knowledge of contract law.*									
IT.42.2.1	Demonstrate knowledge of the key characteristics of contracts and/or legal documents.	x	x	x						
IT.42.2.2	Analyze the elements of a contract for validity (i.e., offer, acceptance, considerations, and subject matter).	x	x	x			x			
IT.42.2.3	Differentiate between types of contracts (e.g., oral, written, implied).	x	x	x						
IT.42.2.4	Differentiate between transferable and nontransferable contracts.	x	x	x						
IT.42.2.5	Identify means of discharging contracts (substantial vs. specific performance).	x	x	x						
IT.42.2.6	Identify remedies available for a breach of contract (legal and nonlegal).	x	x	x						
	Standard 42.3: *Demonstrate knowledge of intellectual property rights covered by intellectual law.*									
IT.42.3.1	Demonstrate knowledge of the various forms of intellectual property rights (e.g., copyright, patent, trademark, trade secrets).	x	x	x					x	
IT.42.3.2	Define *plagiarism.*	x	x	x					x	
IT.42.3.3	Define *authorship.*	x	x	x					x	
IT.42.3.4	Define *work made for hire.*	x	x	x					x	
IT.42.3.5	Define *fair use.*	x	x	x					x	
IT.42.3.6	Demonstrate knowledge of court cases related to intellectual property rights.	x	x	x					x	
IT.42.3.7	Demonstrate knowledge of First Amendment rights.	x	x	x					x	
IT.42.3.8	Demonstrate knowledge of software licensing issues.	x	x	x					x	
IT.42.3.9	Demonstrate knowledge of how to obtain a copyright.	x	x	x					x	
IT.42.3.10	Demonstrate knowledge of how to obtain a patent.	x	x	x					x	

IT.42.3.11	Demonstrate knowledge of how to obtain a trademark.	x	x	x					x	
IT.42.3.12	Identify the perils in acquiring content rights.	x	x	x					x	
IT.42.3.13	Identify the rights granted under copyright, patent, and trademark.	x	x	x					x	
IT.42.3.14	Identify the rights related to electronic imagery.	x	x	x					x	
IT.42.3.15	Identify the liability for copyright infringement.	x	x	x					x	
IT.42.3.16	Identify the liability for invasion of privacy.	x	x	x					x	
IT.42.3.17	Identify the liability for slander and libel.	x	x	x					x	
IT.42.3.18	Demonstrate knowledge of confidentiality issues and their liability implications.	x	x	x					x	
IT.42.3.19	Demonstrate knowledge of the characteristics of warranties.	x	x	x					x	
	Standard 42.4: *Demonstrate knowledge of social, ethical, and legal issues in the information technology field.*									
IT.42.4.1	Analyze the social implications of decisions made and actions taken as an information technology professional.	x	x	x	x	x	x	x	x	x
IT.42.4.2	Demonstrate knowledge of the ethical issues that face information technology professionals.	x	x	x				x	x	x
IT.42.4.3	Demonstrate knowledge of the legal issues that face information technology professionals.	x	x	x				x	x	x
	Quality Assurance									
	INSPIRE>Links>Business>Market Research									
	Standard 43.1: *Demonstrate basic knowledge of quality assurance.*									
IT.43.1.1	Demonstrate knowledge of the historical evolution of quality assurance/total quality management (e.g., Deming, ISO 9000).	x	x	x						
IT.43.1.2	Demonstrate knowledge of changes brought about by quality leaders in the world.	x	x	x						
IT.43.1.3	Demonstrate knowledge of the ISO 9000 process.	x	x	x						
IT.43.1.4	Demonstrate knowledge of the standards/requirements for the Baldrige award.	x	x	x						
IT.43.1.5	Demonstrate knowledge of quality management terminology.	x	x	x						
IT.43.1.6	Identify the role of quality within the organization.	x	x	x						
IT.43.1.7	Identify the features and benefits of quality planning.	x	x	x						
IT.43.1.8	Demonstrate knowledge of the control devices used in functional areas (e.g., SPC, equipment).	x	x	x						
IT.43.1.9	Demonstrate knowledge of the relationship among organizational structures, policies, procedures, and quality assurance.	x	x	x						
IT.43.1.10	Identify internal and external customers.	x	x	x						
IT.43.1.11	Demonstrate knowledge of successful efforts by industry to improve quality and/or reduce costs.	x	x	x						
IT.43.1.12	Differentiate between prevention and detection.	x	x	x						
IT.43.1.13	Differentiate between variable and attribute data.	x	x	x						
IT.43.1.14	Identify types of control charts.	x	x	x						
IT.43.1.15	Demonstrate knowledge of how statistical techniques are used to control quality (e.g., SPC, DOE, CR).	x	x	x						
	Standard 43.2: *Employ quality tools.*									
IT.43.2.1	Demonstrate knowledge of the characteristics and functions of available quality tools.	x	x	x						
IT.43.2.2	Prepare affinity diagrams.	x	x	x			x			
IT.43.2.3	Prepare attributes control charts: nonconforming items.	x	x	x						
IT.43.2.4	Prepare attributes control charts: nonconformities.	x	x	x						
IT.43.2.5	Prepare a cause-and-effect diagrams.	x	x	x						
IT.43.2.6	Prepare check sheets.	x	x	x						
IT.43.2.7	Prepare flowcharts.	x	x	x						
IT.43.2.8	Prepare Histograms.	x	x	x						
IT.43.2.9	Prepare Pareto diagrams.	x	x	x						
IT.43.2.10	Prepare relations diagrams.	x	x	x						
IT.43.2.11	Prepare run charts.	x	x	x						

IT.43.2.12	Prepare scatter diagrams.	x	x	x						
IT.43.2.13	Prepare systematic diagrams.	x	x	x						
IT.43.2.14	Prepare variables control charts: N>1, N=1.	x	x	x						
IT.43.2.15	Interpret charts.	x	x	x			x			
IT.43.2.16	Prepare operational definitions.	x	x	x		x				
IT.43.2.17	Perform force-field analyses.	x	x	x			x			
IT.43.2.18	Employ the Nominal Group Technique.	x	x	x					x	
IT.43.2.19	Perform sampling.	x	x	x					x	
IT.43.2.20	Select quality tool(s) appropriate to situation.	x	x	x						
	Standard 43.3: Apply knowledge of quality cost implications.									
IT.43.3.1	Establish cost/quality objectives.	x	x	x			x			
IT.43.3.2	Classify costs (e.g., direct and indirect, fixed and variable, methods and standards).	x	x	x						
IT.43.3.3	Classify quality costs (e.g., prevention, evaluation, pre-delivery failure, post-delivery failure).	x	x	x						
IT.43.3.4	Interpret quality cost reports.	x	x	x			x			
IT.43.3.5	Establish guidelines for liability prevention.	x	x	x			x			
IT.43.3.6	Identify safety terms of product.	x	x	x						
IT.43.3.7	Identify safety responsibility within organization.	x	x	x					x	x
IT.43.3.8	Differentiate between expressed and implied warranty.	x	x	x						
IT.43.3.9	Differentiate between warranty and product liability.	x	x	x						
IT.43.3.10	Demonstrate knowledge of the role of warranties in contract law.	x	x	x				x		x
	Standard 43.4: *Produce a quality product.*									
IT.43.4.1	Design product (e.g., using brainstorming, thumbnail sketches, rendering).	x	x	x	x	x	x	x	x	x
IT.43.4.2	Consider customer satisfaction in determining product characteristics (e.g., usefulness, price, operation, life, reliability, safety, cost of operation).	x	x	x	x	x	x	x	x	x
IT.43.4.3	Consider reliability factors (e.g., cost, human, producibility).	x	x	x	x	x	x	x	x	x
IT.43.4.4	Achieve reliability through maintainability, good design, design simplification, and design redundancy.	x	x	x	x	x	x	x	x	x
IT.43.4.5	Recognize the relationship of maintainability and reliability.	x	x	x					x	
IT.43.4.6	Test products for reliability.	x	x	x						
IT.43.4.7	Align cost components with quality objectives.	x	x	x					x	
IT.43.4.8	Classify quality costs (e.g., preventive, evaluation, pre- delivery failures, post-delivery failures).	x	x	x						
IT.43.4.9	Initiate predictive maintenance procedures.	x	x	x			x		x	
	Standard 43.5: *Develop interdepartmental relationships to support quality assurance.*									
IT.43.5.1	Recognize need for total commitment to assuring quality (whole company).	x	x	x	x	x	x	x	x	x
IT.43.5.2	Select quality improvement team model.	x	x	x						x
IT.43.5.3	Establish project selection criteria.	x	x	x						x
IT.43.5.4	Determine project implementation cycle.	x	x	x						
IT.43.5.5	Determine project evaluation procedures.	x	x	x						x
IT.43.5.6	Maintain continuous improvement.	x	x	x						x
IT.43.5.7	Investigate future trends in experiment design.	x	x	x						x
IT.43.5.8	Investigate future trends in predictive maintenance.	x	x	x						x
	Training Products									
	INSPIRE>Links>Business>IndustryLink									
	Standard 44.1: *Demonstrate knowledge of developing a training product.*									
IT.44.1.1	Differentiate between training needs and development needs.	x	x	x						
IT.44.1.2	Demonstrate knowledge of the major characteristics of adult learners.	x	x	x						x

IT.44.1.3	Identify methods of product delivery (e.g., Internet, CD-ROM, Audio/Video).	x	x	x					x	
	Standard 44.2: *Develop a training product.*									
IT.44.2.1	Analyze the audience.	x	x	x			x			x
IT.44.2.2	Develop training objectives.	x	x	x						x
IT.44.2.3	Employ sound instructional design principles.	x	x	x						x
IT.44.2.4	Employ a variety of media in presenting training.	x	x	x	x	x	x	x	x	x
IT.44.2.5	Evaluate training effectiveness.	x	x	x			x			
	Statistics									
	Standard 45.1: *Apply measures of central tendency.*									
IT.45.1.1	Define *mean, median,* and *mode.*	x	x	x						
IT.45.1.2	Compute means, medians, and modes.	x	x	x			x			
IT.45.1.3	Interpret measures of central tendency.	x	x	x			x			
IT.45.1.4	Determine when and how to use measures of central tendency in the solution of business problems.	x	x	x			x			x
	Standard 45.2: *Explain measures of dispersion.*									
IT.45.2.1	Define *variance,* average *deviation, standard deviation* , and *coefficient of variation.*	x	x	x						
IT.45.2.2	Compute variance average deviations, standard deviations, and coefficients of variation.	x	x	x			x		x	
IT.45.2.3	Interpret measures of dispersion.	x	x	x			x		x	
IT.45.2.4	Determine when and how to use measures of dispersion in the solution of business problems.	x	x	x			x		x	
	Standard 45.3: *Solve probability problems.*									
IT.45.3.1	Define joint, marginal, and conditional probabilities.	x	x	x						
IT.45.3.2	Solve joint probability problems using addition, multiplication permutation, and combination formulas.	x	x	x			x		x	
IT.45.3.3	Solve marginal probability problems using addition, multiplication permutation, and combination formulas.	x	x	x			x		x	
IT.45.3.4	Solve conditional probability problems using additions, multiplication permutation, and combination formulas.	x	x	x			x		x	
	Basic Electricity									
	INSPIRE>EBSCO Host>MasterFILE									
	Standard 46.1: *Demonstrate an understanding of electrical fundamentals.*									
IT.46.1.1	Identify electrical components and schematic symbols.	x	x	x						
IT.46.1.2	Demonstrate knowledge of the color codes and symbols used to identify electrical components/values.	x	x	x						
IT.46.1.3	Demonstrate knowledge of basic atomic structure and its relationship to electricity.	x	x	x						
IT.46.1.4	Demonstrate knowledge of the relationship between electrical and magnetic properties.	x	x	x						
IT.46.1.5	Demonstrate knowledge of the electrical and magnetic properties of a magnet.	x	x	x						
IT.46.1.6	Demonstrate knowledge of the photoelectric effect.	x	x	x						
IT.46.1.7	Demonstrate knowledge of the thermocouple and Peltier effects.	x	x	x						
IT.46.1.8	Demonstrate knowledge of electrical static change and the role of friction.	x	x	x						
IT.46.1.9	Follow electrostatic discharge (ESD) preventive procedures.	x	x	x		x				x
IT.46.1.10	Identify sources of electricity.	x	x	x						
IT.46.1.11	Demonstrate knowledge of the principles and operation of electrochemical supplies.	x	x	x						
IT.46.1.12	Demonstrate knowledge of the relationship of voltage, current, resistance, power, and energy.	x	x	x						
IT.46.1.13	Apply Ohm's law.	x	x	x						
IT.46.1.14	Apply Kirchhoff's laws.	x	x	x						
IT.46.1.15	Apply power formulas.	x	x	x						
IT.46.1.16	Solve electronic unit problems using metric units.	x	x	x						
	Standard 46.2: *Demonstrate knowledge of operating the various types of equipment used to test/measure DC circuits, AC circuits, solid-state devices, digital circuits, analog circuits, and microprocessors* .									
IT.46.2.1	Demonstrate knowledge of the function and operation of an analog volt-ohm-meter (AVOM).	x	x	x						

IT.46.2.2	Demonstrate knowledge of the function and operation of a digital volt-ohm-meter (DVOM).	x	x	x							
IT.46.2.3	Demonstrate knowledge of the function and operation of a clamp-on amp meter.	x	x	x							
IT.46.2.4	Demonstrate knowledge of the function and operation of oscilloscopes.	x	x	x							
IT.46.2.5	Demonstrate knowledge of the function and operation of a logic probe and logic analyzer.	x	x	x							
IT.46.2.6	Demonstrate knowledge of the function and operation of a power monitor.	x	x	x							
IT.46.2.7	Demonstrate knowledge of the function and operation of a signal generator.	x	x	x							
IT.46.2.8	Demonstrate knowledge of the function and operation of a spectrum analyzer.	x	x	x							
IT.46.2.9	Demonstrate knowledge of the function and operation of an AC/DC hi-pot.	x	x	x							
IT.46.2.10	Demonstrate knowledge of the function and operation of a time-domain reflectometer (TDR).	x	x	x							
IT.46.2.11	Demonstrate knowledge of the function and operation of a megger.	x	x	x							
IT.46.2.12	Demonstrate knowledge of the function and operation of a curve tracer/analogger.	x	x	x							
IT.46.2.13	Measure properties of circuits using electrical test/measurement equipment.	x	x	x							
IT.46.2.14	Troubleshoot a multicomponent electrical circuit using electrical test/measurement equipment.	x	x	x							
	Fundamentals of Electronics Technology										
	INSPIRE>EBSCO Host>Academic Search										
	Standard 47.1: *Distinguish between analog and digital phenomena and circuits.*										
IT.47.1.1	Demonstrate knowledge of the analog and digital measurement techniques for physical parameters (e.g., temperature, time, current, number of items coming down a production line).	x	x	x							
IT.47.1.2	Distinguish between an analog and a digital clock.	x	x	x							
IT.47.1.3	Demonstrate knowledge of the function and operation of the instruments used to measure analog signals.	x	x	x							
IT.47.1.4	Demonstrate knowledge of the function and operation of the instruments used to measure analog digital signals.	x	x	x							
IT.47.1.5	Demonstrate knowledge of how an analog signal can be converted to a digital signal.	x	x	x							
IT.47.1.6	Demonstrate knowledge of how a digital signal can be converted to an analog signal.	x	x	x							
	Standard 47.2: *Demonstrate proficiency in working with microcomputer systems.*										
IT.47.2.1	Demonstrate knowledge of the essential components of microcomputers and the functions of each.	x	x	x							
IT.47.2.2	Demonstrate knowledge of the principles and operation of bus concepts (e.g., VESA, EISA).	x	x	x							
IT.47.2.3	Demonstrate knowledge of the principles and operation of different types of memory circuits.	x	x	x							
IT.47.2.4	Demonstrate knowledge of the operating systems (e.g., DOS, OS/2, UNIX).	x	x	x							
IT.47.2.5	Demonstrate knowledge of the microprocessor instruction sets.	x	x	x							
IT.47.2.6	Demonstrate knowledge of the principles and operation of microprocessor machine code.	x	x	x							
IT.47.2.7	Apply microprocessor machine code.	x	x	x							
IT.47.2.8	Disassemble microprocessor machine code.	x	x	x							
IT.47.2.9	Demonstrate knowledge of types of input and output devices and peripherals.	x	x	x							
IT.47.2.10	Demonstrate knowledge of the principles and operation of storage devices.	x	x	x							
IT.47.2.11	Connect input and output ports to peripherals.	x	x	x							
IT.47.2.12	Demonstrate knowledge of central processing unit building blocks and their uses.	x	x	x							
IT.47.2.13	Demonstrate knowledge of the levels of computer languages.	x	x	x							
	Standard 47.3: *Demonstrate proficiency in working with computer system architecture.*										
IT.47.3.1	Demonstrate knowledge of the principles and operation of computer system architecture.	x	x	x							
IT.47.3.2	Operate computer system architecture.	x	x	x							
IT.47.3.3	Repair computer system architecture.	x	x	x							
IT.47.3.4	Demonstrate knowledge of the principles and operation of addresses and interrupts.	x	x	x							
IT.47.3.5	Demonstrate knowledge of the principles and operation of volatile and nonvolatile memory.	x	x	x							
IT.47.3.6	Demonstrate the use of volatile and nonvolatile memory.	x	x	x							
IT.47.3.7	Repair/replace volatile and nonvolatile memory.	x	x	x							

IT.47.3.8	Demonstrate knowledge of the principles and operation of advanced memory techniques.	x	x	x					x	
IT.47.3.9	Define individual system blocks.	x	x	x						
IT.47.3.10	Draw systems configuration in block detail.	x	x	x						
IT.47.3.11	Interpret computer acronyms.	x	x	x						
IT.47.3.12	Demonstrate knowledge of priorities and interrupts at systems level.	x	x	x						
IT.47.3.13	Demonstrate knowledge of direct-memory-access data-handling system(s).	x	x	x					x	
IT.47.3.14	Define functions of advanced memory techniques (e.g., virtual, pipeline, cache).	x	x	x					x	
	Standard 47.4: *Demonstrate knowledge of the basic elements of communication interfacing.*									
IT.47.4.1	Demonstrate knowledge of common EIA, IEEE, and ITU-T (formerly CCITT) communication standards (e.g., EIA 232 and 485, IEEE 488) and their applications.	x	x	x						
IT.47.4.2	Demonstrate knowledge of the function and operation of sync devices.	x	x	x						
IT.47.4.3	Demonstrate knowledge of the function and operation of async devices.	x	x	x						
IT.47.4.4	Demonstrate knowledge of types of networks (e.g., token ring, Ethernet).	x	x	x						
IT.47.4.5	Demonstrate knowledge of networking levels or layers.	x	x	x						
IT.47.4.6	Demonstrate knowledge of protocols.	x	x	x						
IT.47.4.7	Demonstrate knowledge of the function and operation of packet switching.	x	x	x						
IT.47.4.8	Demonstrate knowledge of multi-user systems.	x	x	x						
IT.47.4.9	Demonstrate knowledge of types of network analyzer devices (e.g., breakout box, sniffers).	x	x	x						
IT.47.4.10	Operate network analyzer devices.	x	x	x						
	Standard 47.5: *Apply troubleshooting and repair techniques to a microcomputer system.*									
IT.47.5.1	Demonstrate knowledge of the role of preventive maintenance.	x	x	x						
IT.47.5.2	Differentiate between normal and abnormal operations.	x	x	x						
IT.47.5.3	Demonstrate knowledge of standard troubleshooting procedures.	x	x	x						
IT.47.5.4	Identify available troubleshooting aids and tools.	x	x	x						
IT.47.5.5	Demonstrate knowledge of safety rules for troubleshooting and repair.	x	x	x						
IT.47.5.6	Demonstrate knowledge of the techniques for identifying thermal failures.	x	x	x						
IT.47.5.7	Identify logical actions to take for a specific troubleshooting situation.	x	x	x					x	
IT.47.5.8	Secure needed information using diagnostic software.	x	x	x						
IT.47.5.9	Secure needed information using manufacturer's manuals, schematics, and troubleshooting charts.	x	x	x						
IT.47.5.10	Interpret prints.	x	x	x						
IT.47.5.11	Isolate faults to systems boards.	x	x	x						
IT.47.5.12	Isolate faults to memory circuits.	x	x	x						
IT.47.5.13	Isolate faults to data storage devices.	x	x	x						
IT.47.5.14	Isolate faults in power supplies.	x	x	x						
IT.47.5.15	Troubleshoot I/O ports.	x	x	x						
IT.47.5.16	Isolate faults in I/O interface circuitry.	x	x	x						
IT.47.5.17	Repair faults.	x	x	x						
IT.47.5.18	Maintain troubleshooting and repair records.	x	x	x					x	
	Telecommunications									
	INSPIRE>EBSCO Host>Business Source									
	Standard 48.1: *Demonstrate knowledge of transmission line applications.*									
IT.48.1.1	Define power conversion.	x	x	x						
IT.48.1.2	Demonstrate knowledge of the principles and operation of two-wire and four-wire transmission lines.	x	x	x						
IT.48.1.3	Demonstrate knowledge of the principles and operation of coaxial cable.	x	x	x						
IT.48.1.4	Demonstrate knowledge of the principles and operation of a microwave guide and wireless.	x	x	x						

IT.48.1.5	Demonstrate knowledge of the principles and operation of fiber optics, analog, and digital circuits.	x	x	x							
	Standard 48.2: *Demonstrate proficiency in working with transmitters and receivers.*										
IT.48.2.1	Demonstrate knowledge of Federal Communication Commission (FCC) rules and regulations and PUCO.	x	x	x							
IT.48.2.2	Demonstrate knowledge of the principles and operation of RF amplifiers.	x	x	x							
IT.48.2.3	Demonstrate knowledge of the principles and operation of modulation/demodulation (e.g., AM, FM, SSB, DSSC, pulse modulation).	x	x	x							
IT.48.2.4	Construct modulators/demodulators.	x	x	x							
IT.48.2.5	Operate modulators/demodulators.	x	x	x							
IT.48.2.6	Demonstrate knowledge of the principles and operation of microwave and satellite communication systems.	x	x	x					x		
IT.48.2.7	Demonstrate knowledge of the principles and operation of repeater systems (e.g., trunk and fiber/scramble/data).	x	x	x					x		
	Standard 48.3: *Demonstrate knowledge of various types of multiplexing systems.*										
IT.48.3.1	Demonstrate knowledge of the principles and operation of analog multiplexing systems (e.g., CATV).	x	x	x							
IT.48.3.2	Demonstrate knowledge of the principles and operation of digital multiplexing systems (e.g., T-1, fiber).	x	x	x							
	Standard 48.4: *Demonstrate proficiency in working with data communications.*										
IT.48.4.1	Demonstrate knowledge of the principles and operation of data communications, signaling systems, codes, formats, and protocols.	x	x	x							
IT.48.4.2	Demonstrate knowledge of the principles and operation of parallel and serial ports.	x	x	x							
IT.48.4.3	Demonstrate knowledge of the principles and operation of synchronous and asynchronous signals.	x	x	x							
IT.48.4.4	Demonstrate knowledge of the principles and operation of data modems.	x	x	x							
IT.48.4.5	Operate data modems.	x	x	x							
IT.48.4.6	Demonstrate knowledge of the principles and operation of fax machines.	x	x	x							
IT.48.4.7	Demonstrate knowledge of the principles and operation of various types of networks (e.g., Ethernet, token ring).	x	x	x							
IT.48.4.8	Operate various types of networks.	x	x	x							
IT.48.4.9	Employ accepted techniques for cable termination (e.g., UTP, COAX, FIBER).	x	x	x							
	Standard 48.5: *Troubleshoot data communications.*										
IT.48.5.1	Isolate system faults in data modems.	x	x	x							
IT.48.5.2	Isolate system faults in various types of networks.	x	x	x							
IT.48.5.3	Isolate system faults in various types of cable.	x	x	x							
IT.48.5.4	Isolate system faults in various types of carrier systems.	x	x	x							
IT.48.5.5	Demonstrate knowledge of networking topologies.	x	x	x							
IT.48.5.6	Determine hardware communication faults utilizing diagnostic tools.	x	x	x							
IT.48.5.7	Identify network problems utilizing network management tools (e.g., hardware, software carriers).	x	x	x							
	Standard 48.6: *Demonstrate proficiency in working with fiber optic communications systems.*										
IT.48.6.1	Employ accepted techniques for fiber splicing.	x	x	x							
IT.48.6.2	Employ accepted techniques for fiber termination.	x	x	x							
IT.48.6.3	Demonstrate knowledge of the basic characteristics of optics (e.g., reflection, total reflection, and refraction).	x	x	x							
IT.48.6.4	Demonstrate knowledge of the characteristics and components of fiber optic cables.	x	x	x							
IT.48.6.5	Identify bandwidth and attenuation limitations for fiber optic systems.	x	x	x							
IT.48.6.6	Demonstrate knowledge of the technique of wavelength multiplexing in fiber optic cables.	x	x	x							
IT.48.6.7	Demonstrate knowledge of the characteristics of various types of light sources and light detectors used in fiber optic systems.	x	x	x							
IT.48.6.8	Identify the components of fiber optic transmission systems and the function of each.	x	x	x							
IT.48.6.9	Demonstrate knowledge of how data signals are transformed into light pulses.	x	x	x							
IT.48.6.10	Operate a simple fiber optic data transmission system.	x	x	x							
IT.48.6.11	Demonstrate knowledge of the characteristics of multi-mode and single-mode systems.	x	x	x							

	Standard 48.7: *Practice RF systems safety.*									
IT.48.7.1	Comply with safety procedures for working with RF systems antennae and support structures (e.g., towers).	x	x	x						
IT.48.7.2	Comply with safety procedures for working with RF systems high voltage/power supply.	x	x	x						
IT.48.7.3	Comply with safety procedures for working with RF generators.	x	x	x						
IT.48.7.4	Comply with safety procedures for working in RF radiating environments.	x	x	x						
	Standard 48.8: *Demonstrate knowledge of antenna systems.*									
IT.48.8.1	Demonstrate knowledge of the principles and operation of single-element antennae (e.g., 1/4 wave dipole, longwire, vertical).	x	x	x						
IT.48.8.2	Demonstrate knowledge of the principles and operation of multi-element antennae (e.g., point-to-point, broadcast).	x	x	x						
IT.48.8.3	Demonstrate knowledge of the principles and operation of impedance matching of antennae systems.	x	x	x						
IT.48.8.4	Demonstrate knowledge of antennae system measurement.	x	x	x						
	Standard 48.9: *Demonstrate knowledge of telecommunications networks.*									
IT.48.10.1	Demonstrate knowledge of the role telecommunication networks play in the contemporary business environment.	x	x	x	x	x	x	x	x	x
IT.48.10.2	Demonstrate knowledge of how voice, data, and video inputs are converted to electromagnetic signals.	x	x	x						
IT.48.10.3	Demonstrate knowledge of advanced telecommunication technologies, including frame relay and ATM.	x	x	x						
IT.48.10.4	Demonstrate knowledge of how to design telecommunication protocols.	x	x	x						
IT.48.10.5	Demonstrate knowledge of the TCP/IP protocol and how each layer functions.	x	x	x						
IT.48.10.6	Identify applications that should be addressed using the client-server model.	x	x	x						
IT.48.10.7	Demonstrate knowledge of the X.25 protocol.	x	x	x						
IT.48.10.8	Demonstrate knowledge of the characteristics and function of ISDN and ISDN signaling.	x	x	x						
IT.48.10.9	Demonstrate knowledge of the characteristics and function of frame relay congestion control.	x	x	x						
IT.48.10.10	Demonstrate knowledge of the characteristics and function of asynchronous transfer mode (ATM).	x	x	x						
IT.48.10.11	Demonstrate knowledge of legacy traffic over ATM.	x	x	x						
IT.48.10.12	Demonstrate knowledge of how ATM traffic is managed.	x	x	x						
IT.48.10.13	Demonstrate knowledge of ATM PNNI.	x	x	x						
IT.48.10.14	Demonstrate knowledge of mobile communications technologies, including cellular and personal communication networks.	x	x	x					x	
IT.48.10.15	Demonstrate knowledge of international telecommunications standards, models, trends.	x	x	x				x	x	x
IT.48.10.16	Demonstrate knowledge of error detection and correction systems.	x	x	x						
IT.48.10.17	Demonstrate knowledge of the characteristics and function of data compression.	x	x	x						
IT.48.10.18	Demonstrate knowledge of the characteristics and function of data concentration.	x	x	x						